THE IRON TRADE REVIEW

VOLUME XXVIII. CLEVELAND, O. NOVEMBER 14, 1895. CHICAGO, ILL. NUMBER 46.

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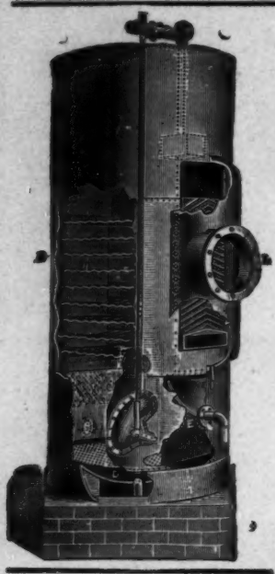

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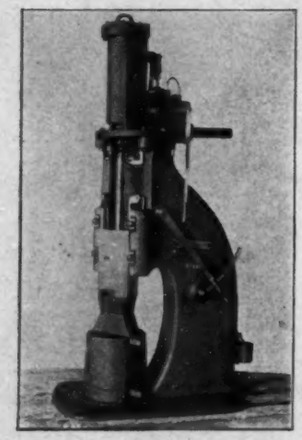

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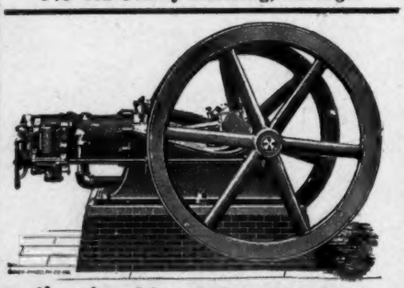

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THE IRON TRADE REVIEW

VOLUME XXVIII. CLEVELAND, O. NOVEMBER 14, 1895. CHICAGO, ILL. NUMBER 46.

THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The anomaly of some phases of the iron situation is emphasized in the current statistics of stocks and production. The October figures showed, as those of the few preceding months had shown, that production of pig iron increased in a marked degree in that month, and yet stocks continued to decrease. Coke iron stocks fell 25,000 tons in October, leaving but 170,000 tons or less than a week's supply of that iron on hand—a smaller amount than has been reported at any time since 1888. When it is considered that the furnaces of the country are producing at the yearly rate of nearly 11,500,000 tons of pig iron and that at the beginning of the month the consumption was in excess of this rate, the inherent strength of the situation becomes apparent in spite of the evidences of weakness that appear in the limited business of the past few weeks. Returns from the districts producing the bulk of the country's Bessemer iron shows increasing production, no stocks on hand and continued weakness in price, though consumption is at the highest rate yet attained. A valley price of $13.50 has been touched on speculative Bessemer the past week, yet furnaces seem not to waver in their confidence that $15 in the valley is the basis on which business will be done when producer and consumer again deal directly. The steel billet market is only nominal in the absence of demand. Some small sales are made at prices below $19.50 Wheeling, and in the neighborhood of $20 Pittsburg, while offers of steel in the Cleveland market at $20.75 have not resulted in transactions. At Philadelphia sales have been made at $21.25. The demand for finished material is almost uniformly light and reports of shaded prices are heard here and there. Good sized orders are scarce but anything desirable is closely competed for. The closing of two bar iron mills at Birmingham, Ala., was not by agreement of the Merchant Bar Iron Association, as reported in the dispatches, but by agreement with each other. One of the mills has accumulated considerable stock and the districts reached from Birmingham will not lack for material meantime. Chicago reports some car buying with resulting contracts for Western mills, and the first wire rod sales of moment in weeks were made in that district. The fact that jobbers are carrying very light stocks of wire nails in view of the high prices, is affecting the steel market, the nail mills keeping in close step with current buying. While the wait goes on in all lines, there is a constant reduction of stocks in second and third hands, and the result promises to be a well cleaned up condition of things by the time the next buying movement takes place. And this, too, applies all along the line, from ore to nails.

THE CLEVELAND DISTRICT.

The official figures collected by ore shippers show a total movement of 9,346,741 tons to Nov. 1, or more than the water and all-rail shipments from Lake Superior in any entire year. To Nov. 1, 1894, the total was 7,046,928 tons. While the present month will show very small shipments from any port but Escanaba, it is evident that when the rail shipments for 1895 are added the year's total will be well up toward 10,000,000 tons. Duluth freights have remained at $2 the past week but the Escanaba rate has weakened to $1.10, a drop of 10 cents. There is practically no ore market, since nothing of Bessemer quality is left to sell. The evident shortage of old-range Bessemers has made the use of considerable portions of Mesabi a matter of necessity, and thus more may be found out in the next six months about furnace practice with these ores than furnacemen would have learned in a year if their mixtures were determined by their own choice.

Pig Iron. The Bessemer pig iron market follows in the same rut and a resumption of liberal buying promises to be postponed for some time. The transactions of the week have been of small amounts and sales by furnaces are rare. At $14 in the valley some business is reported and this figure has been shaded in speculative transactions, one going as low as $13.50. Furnacemen figure that with labor on a maximum basis and raw materials at the advanced prices that will come early in the new year, there is no justification of prices sensibly below that which they have been asking. The practical control of the Connellsville coke business by the Carnegie Steel Co.'s allied interest is construed to mean for the steel company the practical neutralization of the advantage now enjoyed by Lake Erie steel plants. With coke at $2 to other steel makers the leading interest will still be able to meet any competition that may come from more economical assembling points. The situation as to foundry iron has not changed in the week. The carload lot business keeps up and some producers are making cuts of 25 to 50 cents on the valley basis of $15 for No. 1 heretofore maintained. Foundries are putting off buying and December is the time set by many of them for new contracts. Consumption by foundries keeps up at a good rate and furnaces are often crowded for shipments. Lake Superior charcoal has been fairly active and some contracts have been made at shaded prices. The quoted range is $15.50 to $16, Lake Erie port. We hear of a sale of 500 tons of gray forge at $12 in the valley.

Finished Material. Bridge construction seems to be the most important factor in local demand. All the bridge works whose purchases are made in this market are very busy and some have contracts running several months ahead. Sales of shapes on bridge account have been made the past week, the requirements of two or three concerns coming close to 1,000 tons. On angles 1.50c Pittsburg was done and on beams and channels 1.60c. Plates show more weakness than shapes and the Pittsburg price of 1.65c has been cut freely. It seems now to be the policy of the larger concerns to meet going competition on orders with reasonably close deliveries, but mills are not tying up to long contracts at lower prices. Bar iron is quiet. On bar steel there has been a shading of 1.35c, Pittsburg, but this figure is still minimum with some sellers. The weakness of the billet market prompts waiting in a number of lines. One sale of basic billets is reported at $28 Cleveland. Old material is dull, with dealers disinclined to sell on the present basis, which is a drop of from $1 to $2 in the past month.

THE CHICAGO OUTLOOK.

[SPECIALLY REPORTED FOR THE IRON TRADE REVIEW.]

The local market is in rather a peculiar condition at the present time, as regards quotations. A number of large buyers of different classes of material are reported in the market for round lots, but apparently are waiting before placing their orders for a drop in prices. They claim that cuts in quotations have already been made, and that further reductions in prices are to be expected before the end of the year. On the other hand, mill and furnace representatives say that there is nothing in the situation to cause a slump in prices; that the market is very strong and that higher prices may be looked for after Jan. 1. It seems to be a fact, however, that the time between now and the first of the new year is looked forward to by mills and furnaces with some apprehension. They feel that if this time can be tided over with no serious breaks the danger will be over and buyers will be more willing to make their purchases at the present prices, or higher. The only active branch of the market is the bar iron trade, which keeps up well. Several good orders were placed by car works last week, and others are in prospect. Two round lots of rods were sold, but no billets. A fair tonnage of rails was closed. Structural shapes are in fair demand.

PIG IRON.—The market is still quiet, and no particularly large orders have been taken. Consumers are only buying for immediate needs, to cover their wants until the end of the year. Some inquiry is noted for iron for delivery next year, but so far only a few small contracts have been placed. Furnaces North and South are very firm, and are not particularly desirous of selling for '96 delivery at the present quotations. Buyers, also, appear to be willing to wait, at least until next month, before making any serious efforts to fill any part of their requirements for next year. Quotations are made as follows:

Lake Sup. Charcoal.....	$15 50@16 00	Southern No. 2 Soft.....	$.....@13 85
Local Coke Fdy. No. 1...	15 00@15 50	South'n Silveries No. 1.	.....@15 35
Local Coke Fdy. No. 2...	14 50@15 00	South'n Silveries No. 2.	.....@14 85
Local Coke Fdy. No. 3...	14 00@14 50	Jackson Co. Silveries...	15 50@16 00
Local Scotch Fdy. No. 1.	15 00@15 50	Ohio Silveries No. 1.....	15 00@15 50
Local Scotch Fdy. No. 2.	14 50@15 00	Ohio Silveries No. 2.....	14 50@15 00
Local Scotch Fdy. No. 3	14 00@14 50	Ohio Strong Softeners...	15 00@15 50
South'n Coke No 2.....	.....@13 85	Alabama Car Wheel.....	17 00@17 50
South'n Coke No 3.....	.....@13 60	Malleable Bessemer.....	.....
Southern No. 1 Soft.....	.....@14 10	Coke Bessemer	.....

BARS.—The L. E. & W. Ry. placed an order for 1,000 cars last week, and the bar iron for these was ordered of a Western mill. The Illinois Central also ordered 1,000 cars, and two coal companies ordered 800 gondolas between them. Bars for these cars were also bought of Western mills. Other orders for smaller amounts were placed, and further purchases of cars will probably be made this week. Prices on iron are maintained at 1.50c for common and 1.60c for guaranteed, but steel bars are reported as being sold under the open quotation of 1.60c.

RAILS AND TRACK SUPPLIES.—The week's business has been very fair, but no large single orders have been placed. Quotations are as follows: Rails, $29 and up; splice bars, 1.65c to 1.75c; track bolts, 2.25c to 2.45c; spikes, 1.95c to 2c.

BILLETS AND RODS.—The steel company reports sales of 8,000 tons of wire rods at $31. No orders for billets were received, and the local mills refuse to quote for next year's delivery.

STRUCTURAL MATERIAL.—The total business received, in small lots, has been very good. One or two round lots are expected to be placed this week. Quotations are made: Beams and channels, 1.90c to 2c; angles, 1.85c to 1.90c; plates, 1.85c to 1.90c; tees 1.90c to 2c. Small lots from stock are quoted ¼ to ½c higher.

PLATES.—The demand has been fairly good, and a fair week's business has been done. Prices are hardly so strong and are now made as follows: Tank steel, 1.85c to 1.90c; flange steel, 2.10c to 2.20c; firebox steel, 2.85c to 5c; boiler tubes, 60 to 65 per cent discount.

MERCHANT STEEL.—A better inquiry is being had, and orders for shipment on contracts are very heavy. Quotations are unchanged, as follows: Open-hearth spring, tire and machinery steel, 2.20c to 2.25c; smooth finished machinery steel, 1.95c to 2c; smooth finished tire, 1.90c to 1.95c; tool steel, 5.50c to 7.50c; specials, 11c and upwards; Bessemer bars, 1.65c to 1.75c.

SHEETS.—Jobbers have commenced to ask for prices, as a number of their contracts run out Dec. 1, and they will probably be ready to renew their stocks by that time. A number of orders of fairly good size have been placed by consumers, and the demand keeps up well. Quotations are now made at 2.75c for No. 27 common iron, and 2.85c for sheet steel. Galvanized sheets are quoted at 70 and 10 and 5 per cent off.

OLD RAILS AND WHEELS.—The market has been quiet on both rails and wheels, and only a few small lots have changed hands. Old iron rails are quoted at $16.50 to $17; old steel rails at $12.50 to $13.50 according to length, etc. Old wheels $13 to $13.25.

SCRAP.—The only sale of importance was one of 500 tons of No. 1 railroad cast at $10.65, Chicago, per net ton. This is considerably higher than the quotations furnished by the dealers. There seems to be a wide difference of opinion as to the value of scrap between dealers and original holders and it is almost impossible to get correct selling quotations. The following are buying quotations furnished by dealers. Railroad forge, $13; dealer's forge, $11; No. 1 mill, $8 to $8.50; railroad cast, $9; machinery cast, $9.50; axles, $16; cast borings, $5.50; wrought turnings, $6.50; axle turnings, $7.50; mixed steel, $10; stoveplates, $6 to $6.50; heavy melting steel, $12.50.

IN OTHER MARKETS.

[SPECIALLY REPORTED FOR THE IRON TRADE REVIEW.]

Pittsburg.

There is little market on which to report, but so far as anything has been done in Bessemer pig and steel, lower prices have prevailed. Bessemer iron has sold as low as $13.50 at valley furnaces, the iron being in second hands. Small lot sales are reported from the figure named, up to $14.50 valley furnace. There is little expectation now of any material change in the situation for several weeks. Furnacemen in the valleys are represented to occupy substantially the position of a month ago. They are willing to sell Bessemer at $15.00 at furnace, and believe that in view of the higher price for ore, that is a practical certainty, and the probability of $2 coke, this figure is conservative. Steel seems to be in no demand whatever, and quotations of $19.25 and $19.50 Wheeling, and $20 to $20.25 Pittsburg are nominal. The market for gray forge is weaker, demand being very light. A sale of 1,500 tons and one of 500 tons are reported at $12.50 in this market. Finished material continues quiet. There is more anxiety by some mills to get orders, but buyers are not contracting largely. A small-lot business is looked for to the end of the year. Prices on structural material are held at 1.60c.@165c. for beams and channels, and at 1.65c for tank plate. The trade in bars is of moderate proportions with some reports of, cutting below 1.40c. on common iron. Steel is quoted 1.35c.@1.40c. Some of the sheet mills are more desirous of orders and 2.60c on No. 27 is scarcely minimum. The skelp market is weak and 1.35c on grooved iron skelp has

been shaded. In connection with the recent acquisition by the Frick Coke Co., of the McClure Co.'s properties and those of the Fairchance Furnace Co., it is stated that the Frick Co. controls also the output of Brown & Cochran and takes the surplus output of several smaller operators, thus making its hold secure upon nearly 80 per cent. of the Connellsville product. The probability of $2 coke Jan. 1 is regarded by many furnacemen as a practical certainty. The production of Connellsville ovens in October was unprecedented, the average being between 170,000 and 171,000 tons a week. Shipments in the week ending Nov. 2, were 9,314 cars. In the same week the number of active ovens is estimated at 15,051, with an output of 173,185 tons.

Cincinnati. The business of the week under review has been fair in volume. The run of carload and small lot orders coming from all sections of the country, and from every kind of industry using pig iron, indicates that there is more or less activity generally. The stove and radiator manufacturers are crowded with orders, and are running full capacity, notwithstanding the mild weather prevailing over the country. The scarcity of cars is preventing an adequate supply of iron and coke, and the principal difficulty in the trade at this writing, is getting iron forward to consumers. There are some important car contracts pending, which it is hoped will materialize early and facilitate transportation, which is being taxed to its capacity, and should general business revive, as many predict, the additional facilities will be greatly needed. The political campaigns have been more or less disturbing, but now that the elections have occurred and been so pronouncedly one sided, merchants and manufacturers will adapt themselves to what seems the fixed political sentiment of the country for some time to come. While prices are somewhat irregular, occasioned by the presence on the market of several speculative lots and some warrants, the furnaces in the main and especially the strong companies of the South, are so sold up there is no reason to expect reduction in price, especially in view of the marked increase in the cost of manufacturing pig iron.

Buffalo. The local market has been quiet during the past week. The odd lots of Southern iron offered on this market at a slight cut under full prices has had a tendency to check sales for extended delivery. Some buyers seem to feel this is a sign of lower prices, therefore have refrained from buying for more than immediate consumption. Orders are reported in 100 to 500 ton lots, and, as they seem to be for immediate shipment, we take it the iron is needed for early use. While the market is not weak yet it is no stronger. On the other hand, furnaces running on foundry iron in the North have all they can do to keep their regular customers supplied. We do not know of a furnace making foundry iron in this district that has any stock on hand. The entire output of the furnaces is shipped out each day and more trouble is experienced in getting iron delivered in time to keep the foundry from shutting down than in marketing the output. It is evident the consumption of foundry iron is increasing.

A CHARTER has been granted to the Virginia Bridge & Iron Co., of Roanoke, Va., which succeeds the American Bridge Co. The capital stock is $50,000. Samuel Wolton is president and C. E. Michael, secretary-treasurer.

THE lining of Charlotte furnace at Scottdale, Pa., gave way Nov. 11 and the furnace was blown out for relining at the bosh. It will resume about Dec. 1. Corrigan, McKinney & Co., Cleveland, are the lessees.

CONDITION OF BLAST FURNACES OF U. S.*

Nov. 1, 1895.

Location of Furnaces.	Charcoal.					Bituminous or Coke.				
	Total No. of Stacks.	In Blast.		Out of Blast.		Total No. of Stacks.	In Blast.		Out of Blast.	
		Number.	Weekly capacity.	Number.	Weekly capacity.		Number.	Weekly capacity.	Number.	Weekly capacity.
New England	11	2	240	9	829					
New York	6	1	94	5	637	5	1	1361	4	5003
Pennsylvania	13	3	159	10	825	5	3	2986	2	1440
Pittsburgh						24	22	42972	2	2376
Spiegel						2	2	2064		
Shenango Valley						16	14	17649	2	1361
Jun. and Con. Vals.						17	11	11506	6	2635
Maryland	4			4	310	5			5	5955
Virginia	4			4	210	23	12	8203	11	5938
North Carolina						2			2	745
West Virginia						4	3	3574	1	260
Ohio—Mahoning Val.						12	10	12932	2	3070
East, Cent. & North.						17	16	19698	1	1660
Hocking Valley						6	1	857	5	1749
Hanging Rock	10	5	392	5	479	11	8	2560	3	605
Kentucky	3			3	865	6	4	2272	2	880
Tennessee	8	2	535	6	1810	13	6	5893	7	3860
Georgia	3	1	282	2	375	2	1	620	1	740
Alabama	12	3	778	9	2050	39	20	19814	19	11560
Indiana						2			2	275
Illinois						19	16	27833	3	3245
Michigan	20	5	1777	15	4919					
Wisconsin	4	2	1220	2	445	4	4	3544		
Minnesota						1			1	665
Missouri	2			2	580	3	1	996	2	1425
Texas	4			4	985					
Oregon	1			1	280					
Colorado						3	1	1000	2	1598
Total (char. and coke)	105	24	5477	81	15990	241	156	188334	85	57050
Total anthracite (New York, New Jersey, and Lehigh, Schuylkill, Upper and Lower Susquehanna and Lebanon valleys.)	126	58	37355	68	27730					

SUMMARY.

Fuel.	In Blast.						Out of Blast.			
	Number.			Weekly Capacity.			Number.		Weekly Capacity.	
		Month Previous.	Year Previous.		Month Previous.	Year Previous.		Month Previous.		Month Previous.
Charcoal	24	22	23	5,477	5,061	4,799	81	83	15,599	15,990
Anthracite	58	56	37	37,355	35,799	19,383	68	70	27,730	28,828
Bituminous	156	149	128	188,334	178,798	147,232	85	92	57,050	62,541
Total	238	227	188	231,166	219,658	171,414	234	245	100,379	107,359

* Condensed from the *American Manufacturer*.

Personal.

James MacNaughton, superintendent of the Chapin mine, and of the F. Rockefeller-Corrigan properties on the Mesabi and Gogebic ranges, has been in Cleveland the past week.

David Evans, general manager of Bolckow, Vaughan & Co., and member of council of the Iron and Steel Institute, is now visiting in the United States.

Asst. Supt. Wood, of the Homestead Steel Works, is absent in Europe on a three months' tour. He will visit iron and steel works on the other side.

Henry Gray, who resigned the superintendency of the Cleveland Rolling Co.'s plant two months ago, has accepted a similar position with the Ironton Structural Steel Co., of Duluth.

J. W. Gephart has resigned as president of the Valentine Iron Co., of Bellefonte, Pa., and John P. Harris has been elected to succeed him.

Charles S. Robinson has been made assistant general superintendent of the Colorado Fuel & Iron Co., Pueblo, Col. F. E. Harnden, formerly chemist at the Milwaukee works of the Illinois Steel Co., succeeds him as superintendent of blast furnaces at Pueblo.

David Baker returns to his old position as superintendent of the blast furnaces of the Maryland Steel Co., which he resigned in 1894. Ralph Sweetser, of Boston, will be his assistant.

A. D. W. Smith, geologist and engineer, late assistant geologist Pennsylvania Geological Survey, has opened an office at 74 Coal Exchange Building, Wilkesbarre, Pa.

THE IRON TRADE REVIEW

DEVOTED TO
IRON AND STEEL MANUFACTURE, FOUNDRY AND MACHINERY TRADES, IRON ORE PRODUCTION, TRANSPORTATION, AND GENERAL INDUSTRIAL PROGRESS.

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ENTERED AT THE POST OFFICE IN CLEVELAND, O., AS SECOND CLASS MATTER

NOVEMBER 14, 1895.

MR. CARNEGIE ON SURPLUS WEALTH.

The dedication of the Carnegie Library and its formal presentation to Pittsburg by its large-hearted giver, at the brilliant gathering of Tuesday evening, Nov. 5, suggest much that needs often to be spoken in this day. But the event itself and the attending circumstances are not more suggestive than the declarations of Mr. Carnegie in handing over the keys of the magnificent building. The teaching he there enunciated was far removed from the "what's mine's mine" of those who seemingly exempt themselves from the rules they are continually laying down for the government of such as have acquired wealth. There is no claim anywhere in the address—in many respects the most striking Mr. Carnegie has made—that the man to whom surplus wealth has come, is the architect of his own fortune, and that the disposal of his surplus is therefore a matter of his own choice. On the contrary, the doctrine is laid down that wealth is not the property of its holder but "a sacred trust to be administered during life by its possessor for the best good of his fellow men."

In elaborating upon the problem of the use of wealth in ways that will best serve the public good, Mr. Carnegie, with characteristic frankness, traverses the ground over which, we take it, his own thoughts have traveled many times. And in this discussion he not only answers well much of the malign criticism that has been directed against himself but disposes of a great deal of specious argument on the best methods of correcting inequalities of possession. The opinion has been more than once expressed that had the men in the employ of this or that millionaire been given higher wages, there would be no great problem to solve in the disposition of surplus wealth, for the reason that the surplus would not exist. In the effort to work upon prejudice and jealousy, for political reasons, the existence of Mr. Carnegie's millions has been many times pointed at as the result of a vicious system. Passing by the fact that there are millionaires in all countries and that profits from steel-making have been by no means confined to the United States, while the wages earned in this industry have been far greater here than in any other country, there is a general consideration that merits attention in this connection. It is well stated by Mr. Carnegie in these words:

"It may be said, if surplus wealth brings such difficulties, much better try to prevent its coming. Distribute every month, for instance, your surplus gains among those you employ. This would be indiscriminate giving, again. The habits and needs of each employee, and the use he would make of the gifts, we should be bound to ascertain. We should no more desire to give unwisely to employes] than to others of like character or habits. Viewed from a business standpoint, also, this would be a disastrous use of wealth both for employer and employe. Business in our day is a matter of small margins, a trifling sum per day upon each man employed. The firm that fails to apply the strictest rules of business will soon find itself of no use whatever to the community, for it will have no employment to give. The continuance of any business depends upon success. It must be successful or slowly sink. Let the slightest laxity of management appear, and its success is endangered; but even were it otherwise, the plan suggested does not commend itself as wise, because there are higher uses for surplus wealth than adding petty sums to the earnings of the masses. Trifling sums given to each every week or month—and the sums would be trifling indeed—would be frittered away, nine times out of ten, in things that pertain to the body and not to the spirit—upon richer food, drink, better clothing, more extravagant living, which are beneficial neither to workman nor millionaire; these are things external and of the flesh; they do not minister to the higher, the divine part of man. * * * I am not content to pass down in the history of Pittsburg as one who only helped the masses to obtain greater enjoyment of those appetites which we share equally with the brutes—more to eat, more to drink and richer raiment. 'Man does not live by bread alone.' I have known millionaires starving for lack of the nutriment which alone can sustain all that is human in man, and I know workmen and many so-called poor men who revel in luxuries beyond the power of those millionaires to reach. It is the mind that makes the body rich. There is no class so pitiably wretched as that which possesses money and nothing else."

The considerations here urged are not often talked about in wage discussions, to be sure. The points usually gone over, when the question of higher wages comes up between employer and employes, are the price paid by competitors, the condition of demand, and the market price for product. Theorize as we will about a better system than that of to-day—for some arrangement by which the employe shall have something more than a wage determined by competition, skill, and the supply of efficient labor, there is no escape from the fact that the firm that fails to apply the strictest rules of business will soon have no employment to give. And where, by exceptional opportunity, or exceptional management, a greater than ordinary profit is made for some time, the rule still holds that the permanency of the industry depends upon the continued enforcement of the policy that brought success.

But there are signs that the question of surplus wealth disposal will be less and less of a problem. We have commented on other occasions on the infrequency of profit from industrial investments and on the larger share that is coming to labor, in these days of its more perfect organization and of the sharper competitions that come out of the application to business, of the best talent of modern life. The men who are carrying the burdens of active business, which Mr. Carnegie laid down some years ago, are expending far more energy in the turning of a dollar of profit than was necessary in the days in which his surplus was accumulated. It probably calls for as much effort and talent to-day merely to maintain a position, and to keep from being outstripped, as were required one day to make a yearly fortune in iron and steel.

One cannot regard the enormous expenditures that have been made in the past five years in enlarging, renewing and modernizing the Carnegie Steel Co.'s plants, without appreciating the fact that the problem of the surplus is being solved for industrial capital, *nolens volens*. Profits in the majority of cases are rather represented in the form of betterments, compelled by the rapid march of processes, than in a distribution of dividends. Thus labor

is perpetually getting the lion's share. Practically all the millions expended in new equipment at Homestead and Duquesne in the last three or four years, was given to labor. To hold stock in enterprises such as these, under the conditions to which modern industry has come, simply means to add year by year, if there is any profit at all, to the amount at stake, with new solicitude and responsibility coming with each addition.

These considerations do not get attention from the writers who find pleasure in railing at what they term the uneven distribution of the joint product of capital and labor; but they are so palpable that they are unseen only to those who will not see.

IRON IMPORTS AND EXPORTS.

The movement in and out of the United States, of iron and steel and various manufactures thereof has been steadily increasing in the past few months. From being about 30,000 tons in August, imports increased to 40,000 tons in September, as compared with 23,147 tons in September, 1894. The export movement is steadier, but September showed a gain over the corresponding month of last year, as appears from total valuations of $2,899,529 and $2,720,565 respectively. The record for the nine-month periods ending Sept. 30 in the two years is as follows:

	Jan.-Sept. 1895.	Jan.-Sept. 1894.
Iron and steel imports	$18,506,214	$14 583,142
Iron and steel exports	24,851,631	21,382,776

The valuations on imports given above do not include iron ore, of which the imports were valued at $394,027 for 287,429 tons to Sept. 30, this year, and $178,087 for 112,920 tons to Sept. 30 last year. The exports, as is well known, consist almost entirely of machinery, hardware and other manufactured forms of iron and steel, the amount of pig iron and mill products sent out being of comparatively small tonnage. Machinery exports to Brazil and to Africa show the most notable increase. To Brazil $1,330,764 worth was shipped in the first nine months this year, compared with but $591,215 to Sept. 30 last year. Africa's gold mining activity is reflected in purchases of mining machinery, the total of all forms of machinery with African destination being $830,372 to Sept. 30 this year, against $258,505 in the first nine months of 1894. Our Cuban trade in machinery fell off from $1,131,679 last year, to Sept. 30, to $336,520 to the same date this year, thanks to reciprocity repeal.

The import exhibit for iron and steel for September in the two years and for the nine months ending with September appears in the following table:

IRON AND STEEL IMPORTS TO U. S., GROSS TONS, FOR SEPTEMBER AND FOR NINE MONTHS ENDING SEPT. 30, 1894-95.

	September.		Jan.—Sept.	
	1895.	1894.	1895.	1894.
Pig iron	6,641	1,006	20,418	11, 69
Scrap iron and steel	830	376	2,725	1,612
Bar iron	1,673	991	11,776	4 746
Rails	.....	66	589	552
Hoops and ties	.....	.....	50	.....
Hoop and band iron	.....	.....	1	804
Ingots, blooms, billets, etc	2,610	973	14,447	5,322
Sheets and plates	943	2 128	11,277	22.410
Cotton ties	1,492	.....	2,865	.....
Tin plates	22 408	15 607	176,590	152,839
Wire rods	3,118	1 663	18,479	15,736
Wire	496	340	4 741	2,981
	40,211	23,147	263,958	218,171

For September a noteworthy increase appears in nearly every product. Tin plate imports were 50 per cent greater; pig iron 560 per cent, wire rods 100 per cent, ingots, blooms, etc., 170 per cent. The higher prices of all manufactured iron and steel on this side gave a good opening for foreign duty-free cotton ties, about 1,500 tons coming over in September, and July and August together furnishing about an equal amount. The black plate dipping industry supported by importations of Welsh cold-rolled sheets is growing beautifully less, as is indicated in the lessened totals of "sheets and plates" imported. For the nine months ending Sept. 30 this year, 11,277 tons of all kinds of sheets and plates were imported, or only half the total to Sept. 30, 1894. Exports of pig iron, chiefly for malleable and other special purposes, nearly balance the pig iron imports. The total to Sept. 30 was 19,219 tons this year (17,721 tons to Sept. 30, 1894) as against total pig iron imports of 20,418 tons (11,-169 to Sept. 30, 1894) in the same nine months.

OBITUARY.

George R. Sherman, of the well-known iron ore and furnace firm of Witherbee, Sherman & Co., Port Henry, N. Y., died suddenly at his home in Port Henry, Nov. 6, aged 65 years. Heart disease is the supposed cause of death. The deceased was president of the Port Henry National Bank and director of the Citizens' National Bank of Saratoga Springs. The firm of Witherbee, Sherman & Co. has some of the best ore deposits in the Lake Champlain district, and their Cedar Point furnace at Port Henry has run on local ores for the past 20 years.

Lieut. Col. Wm. H. Harris, who died at Genoa, Italy, Nov. 6, of Bright's disease, was born in Albany, N. Y., in 1837, and in 1861 graduated from West Point Military Academy. He served with distinction in the Army of the Potomac, and after the war was stationed at Indianapolis arsenal and at Watertown arsenal. He resigned in 1870 to become secretary and manager of the Decatur Rolling Mill Co. From 1876 to 1880 he was vice-president of the Kansas Rolling Mill Co. After this he was four years treasurer of the St. Louis, Keokuk & Northwestern Railroad Co. From 1887 to 1890 he was engaged in the drainage of the Valley of Mexico. Col. Harris in 1864 married Miss Emma Witt, daughter of the late Stillman Witt, who was a well known railroad man of Cleveland.

Col. Albert W. Johnson, of Ft. Hamilton, L. I., died at the home of his son, Hon. Tom L. Johnson, vice-president of the Johnson Co., in Cleveland, Nov. 6. He was associated with his son in various enterprises, particularly in the control of Indianapolis street car lines. He retired from business eight years ago.

Robert Laird, late of the firm of R. Laird & Son, Galion, O., died very suddenly on the evening of Nov. 5, of paralysis of the heart, while closing the meeting of Dick Morris Post No. 130, G. A. R., of which he was Post Commander. At present the business of the Galion Steam Boiler Works will be continued under the original firm name.

Western Foundrymen's Association.

The next meeting of the Western Foundrymen's Association will be held at the Great Northern Hotel, Chicago, at 7:30 P. M., Nov. 20, 1895. A paper by Mr. Thomas D. West, entitled "Stretching Cast Iron and Principles Involved in Its Contraction," will be read at this meeting.

The new by-laws which have been in course of preparation for several months past will be presented and discussed at this meeting, and a full attendance is particularly desired on this account. S. T. JOHNSTON, Sec'y.

JEREMIAH HEAD and his son, Archibald Head, who have been appointed consulting engineers to the Otis Steel Co., on behalf of the English debenture-holders, are now in Cleveland on business connected with the reorganization of the company. While they have not given out their plans, it is understood that extensions of the plant are contemplated and that the expectation is that a large amount will be expended in providing dockage, building blast furnaces and modernizing the steel plant.

AT New York, Nov. 11, judgment for $54,204.84 was entered against the Sinnemahoning Iron & Coal Co., in favor of the Central Trust Co., balance on a note for $76,362.50 given April 20, 1894. The company owns Emporium furnace at Emporium, Pa., which has been idle for several years.

FOUNDRYMEN'S ASSOCIATION.

The annual meeting of the Foundrymen's Association was held at the Manufacturers' Club, Philadelphia, on Wednesday evening, Nov. 6. The following were present: Walter Wood, R. D. Wood & Co.; Francis Schumann, Tacony Iron & Metal Co.; J. H. Pepper, *Iron Age;* Nathan Bratt; R. B. Sidel; Chas. James, Hy. Disston & Sons; F. C. Price, J. W. Hoffman & Co., Josiah Thompson, J. Thompson & Co.; Arthur W. Howe; I. R. Newkirk, Wm. Wharton, Jr. & Co.; Thos. Glover, Glover Bros.; Thos. I. Rankin, Abram Cox Stove Co.; Thos. Devlin, Thos. Devlin & Co.; F. A. Riehle, Riehle Testing Machine Co.; J. W. C. Moore, Crane Iron Co., Howard Evans, J. W. Paxson & Co., Philadelphia; Douglass G. Moore and Miller F. Moore, Sam'l L. Moore & Sons Co., and Dr. Edward Kirk, Elizabeth, N. J.; Thos. B. Harkins, T. B. Harkins Co., Bristol, Pa.; W. H. Ridgway, Craig Ridgway & Son, Coatesville, Pa.; W. H. Bonner, Carnegie Steel Co., Ltd.; Geo. A. Messick, Pusey & Jones Co., Wilmington, Del.; W. B. Beyer and L. N. McCarter, R. S. Newbold & Son, Norristown, Pa.; T. A. Daly, *Iron Trade Review.*

Secretary Evans read the report of the executive committee, which was as follows:

"Your committee would report that they find trade to be in good condition; rather better than the last month, although there is very little improvement in prices. Freight rates on pig iron have advanced from the South and some Western points, which would tend to hold prices up, but we have found that the foundries have not been successful as a rule in getting the advanced price for castings. We have sent out about 100 letters to different parts of the United States from Maine to California and replies show that while prices are unchanged there is a marked change for the better in the bulk of business. The majority of foundries report that they are busy, some of them even working at night. The outlook for new business is good. It would seem as though during the winter months, when navigation it closed, there would be plenty of business for every trade. The railroads have made large contracts for new cars, wheels and rails, giving employment to a great number of mechanics and helping many lines.

"A number of firms, in answer to the correspondence above referred to, say they will send representatives to our national convention to be held in 1896. The best time for holding the convention would probably be the month of May. The stove convention occurs in New York City the first Wednesday in that month ending on Saturday. It would probably be well to hold our convention on the following Monday of the same month.

"There is a very important question that this association has never taken up, that is the subject of strikes. There is considerable trouble in the vicinity of Boston and New York brought about by the unions. As far as we know, there is very little trouble in this vicinity. It is a question whether this association can take any action in the premises. We would like to hear from some of the members on this subject. There is one thing, however, that impresses us, and that is we are quite sure the proprietor of a foundry has a right to run his own works."

Mr. Devlin cast the single ballot which re-elected for the ensuing year the old board of officers, as follows: President, Francis Schumann, Tacony Iron & Metal Co., Tacony, Philadelphia; vice-president, P. D. Wanner, Reading Foundry Co., Ltd., Reading, Pa.; treasurer, Josiah Thompson, J. Thompson & Co., Philadelphia; secretary, Howard Evans, J. W. Paxson & Co., Philadelphia; executive committee—Walter Wood, chairman, R. D. Wood & Co., Philadelphia; Thos. Glover, Glover Bros., Frankford, Philadelphia; E. E. Brown, E. E. Brown & Co., Philadelphia; Stanley G. Flagg, Jr., Stanley G. Flagg & Co., Philadelphia; Wm. F. Sauter, G. Rebmann & Co., Philadelphia.

Secretary Evans announced on behalf of the convention committee that it had been deemed best to postpone the convention for the present, there being a pretty well-grounded fear that the affair would not be a success if held in November. Mr. Schumann supplemented the secretary's remarks with the explanation that the National Association of Manufacturers would meet in Chicago about that time, and that many would probably not attend the Philadelphia convention on that account.

Three new members were elected as follows: Vaughn Machine Co., Peabody, Mass.; Samuel L. Moore & Sons Co., Elizabeth, N. J.; and C. R. Ellicott & Co., Philadelphia.

Under the head of unfinished business, Mr. Evans read a letter from a correspondent urging the association to secure a paper from President Fox, of the Iron Molders' Association to be read before the convention. This started a discussion upon the strike question which occupied the members during the remainder of the meeting.

Samuel L. Moore, the head of the big shipbuilding firm of Elizabeth, N. J., where a strike is now on, was then introduced and spoke in substance as follows:

"We are suffering from a strike to-day, and it is our first experience of the kind. It was brought about by the Molders' Union. Last spring we were visited by one Perrine, a walking delegate from Brooklyn, who informed us that we ought to pay our men better wages. It was the first intimation that we had of any dissatisfaction among the men. We were then employing from 50 to 75 molders at from $2.25 to $3.50 per day. We had a number of important contracts on hand that we couldn't afford to lose, so we raised some of the lower class men to $2.50. Immediately after this concession, the men took possession of the shop. The delegate again came to us and demanded $2.75 in the fall. Later he came down to $2.65. But we decided that since the men had determined to use force in the matter, to put our foot down, as it were, and hold out against an increase. Accordingly last Monday four weeks ago, the men without any warning went out of the shop, leaving unfinished molds aggregating 25 tons of work. On the following Saturday, pay day, the men came for the money that was due them, but we refused to give it to them until they should finish their work. The men became obnoxious, and we closed down the shop. Now, what I want to know is what we are to do. Are we to give up the shop to the men? How far can a manufacturer yield to the unions and maintain his dignity? I think with a little assistance from other foundrymen we can end the matter."

Mr. Riehle thought that foundrymen ought to combine for self-protection just as the men do. He hoped that Mr. Moore would receive the support of the meeting.

Mr. Flagg in answer to a query of the president, stated that his was a union shop, but that the walking delegate was unknown to him.

"Our molders left us," continued Mr. Moore "without a moment's notice. That's what hurts. They openly declared that the strike had commenced with us because we were weak, and that Philadelphia would be next attacked."

Thomas I. Rankin said: "The trouble is coming to all of us sooner or later. The only question for us to determine is whether we shall meet it individually or as a whole." He then cited a recent experience of his own. He had sent some men to put up a boiler in a Boston building. While his men were at work, a walking delegate came upon the scene, and ordered the work to be stopped. It was not a union made boiler, he said, and if the work went on he would call out every mechanic employed upon the building, even to the painters and carpenters. "And" said Mr. Rankin, "I didn't doubt but that he could and would do it."

Mr. Rankin then reviewed the strike in 1886 at the G. F. Filley works in St. Louis, from which the Stove Founders' Defense Association grew. In conclusion he said: "Are we going to help Mr. Moore? We should do it, and do it at once."

Walter Wood said his firm had had one experience with strikers, and had settled it by joining the strikers themselves. That is, they shut up the shop until the men were ready to come back to work.

Mr. Devlin said he had some trouble several years back, and knew Mr. Fox very well. "If the molders had acted," said he, "as Mr. Fox talked there would have been no trouble, but the molders didn't. In other words, Mr. Fox is an oily talker, but he couldn't deliver the goods. We closed the place, and then the men had the impudence to come and tell us they would make us open the shop again, even if we had to run it at a loss."

"I am satisfied," said President Schumann, "that a man has a right to get as much wages as he can, but I wouldn't let any

organization dictate to me as to how I should pay my men. If the employes organize, so must we, and meet force with force. We must recognize their right to organize, but be careful not to let them overstep the mark."

Mr. Flagg asked Mr. Moore if a committee of his workmen had waited upon him before the strike was declared. Mr. Moore replied in the negative, adding that all the men had been satisfied with their wages before the walking delegate came.

Mr. Schumann thought that at the coming convention, the foundrymen should make a declaration of principles, recognizing the rights of others while maintaining their own, and arranging committees for arbitration.

Mr. Rankin agreed with Mr. Schumann, believing that all differences should be settled upon the basis of right, the employer and the employe being treated justly each in his respective sphere.

Mr. Evans said that that was the real cause of the institution of the present association.

"Another thing to be guarded against," said Mr. Moore, "is the evil of misrepresentation of cost of work. We might perfect a system of reports upon current prices so that one shop shall not underbid another to its own loss."

Mr. Flagg suggested the calling of a special committee to consider this matter of the declaration of principles, but it was finally referred to the executive committee.

A letter was read from Dr. Hunter, who regretted that illness made it impossible for him to be present and read his paper. A lunch concluded the meeting.

USELESS TUBES IN BOILERS.

Fourteen years ago an article under this heading was published in the *Locomotive*. It attracted some considerable attention at the time, and as there are still some boilermakers who do not seem to understand how a tube *can* be useless, we reproduce the article in question below, and we hope shortly to publish some further experiments on the same subject.

In the early history of the horizontal tubular boiler, the opinion prevailed that the more tubes that were crowded into a boiler the greater the efficiency would be. It was not uncommon to find the lower half of a boiler literally packed with 2½-in. tubes. They were put down as near the bottom and the side sheets as the flanging of the tube-head would allow. They were arranged in the boiler on what is known as the "staggered" plan; that is instead of being placed vertically one over another, they were so arranged that the tubes of one row were placed over the spaces of the row next below, and there were consequently no unobstructed spaces through which the water could circulate. But this was not the greatest difficulty. It is well known that the waters used in boilers generally carry more or less impurities in suspension —mechanical or chemical—and that these are deposited in the process of evaporation. The deposit so formed may consist of the carbonates or sulphates of lime or magnesia, or of argillaceous matter, or of mud. It settles upon the bottom and the tubes of the boilers, and if the cleaning is not frequent and careful there will be formed, on the bottom and among the tubes, a very hard scale which cannot be removed without taking out the tubes. When this condition of things has come about, the efficiency of the boiler is greatly reduced. The heating surface being covered, more or less by a substance which is a non-conductor of heat, the heat in passing over it is not taken up, and so passes on and is lost.

Matters were materially improved, in the course of time, by the introduction of tubes of larger diameter (3 inches), arranged in verticle and horizontal rows; but the tubes were still carried very near the bottom and the sides of the shell, and the difficulty was only partially remedied. A great many boilers are made in this manner to-day, and it is a difficult matter to convince some boilermakers that it is erroneous. Their argument is, "the more tubes the more heating surface"; and it must be said that manufacturers, in many instances, have the same views, and in ordering boilers they demand an excessive number of tubes. One object in view in preparing this article is to show that too great a number of tubes does not make the boiler safer, or more efficient. It has been found by experiment that if the two lower rows of tubes in a boiler whose tubes extend down close to the shell are plugged up, the efficiency is not impaired—we are speaking now of externally fired boilers. By studying the progress of the heated gases as they leave the furnace, it will be seen that they pass over the bridge wall, "lick" the bottom of the boiler its entire length, and then turn upward at the rear end and enter the tubes. The levity of these heated gases carries them mainly to the upper rows of tubes, and only a small portion of them enters the lower tubes. To demonstrate this in a way that will be understood by all (though it may not be regarded as occult enough to satisfy some individuals), a clean piece of soft white pine was placed at the front end of a boiler, nearly in contact with the ends of the center (vertical) row of tubes, as shown in Fig. 1, and was left in that position for several days. When again examined it was found that the end of the stick in contact with the upper tube was burned to a coal, so that it barely held together; at the tube next below it was little less charred, and the effects of the heat decreased more and more towards the bottom, as indicated in the illustration. Against the two lower tubes the wood was only a little discolored, showing that the upper tubes were most effective, while the very lowest were of little account.

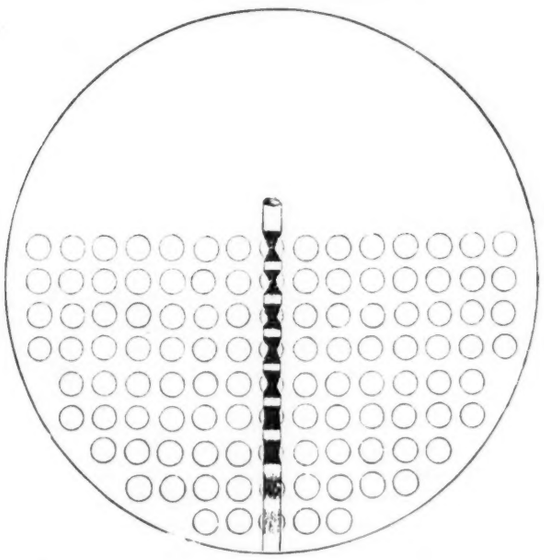


FIG. 1.

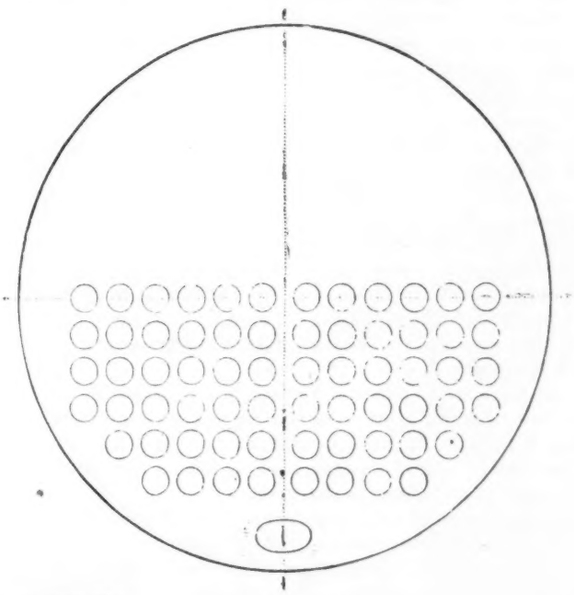


FIG. 2.

USELESS TUBES IN BOILERS.

Another fault with the "close" arrangement of tubes is that, besides the trouble from deposit of sediment, there is no body of solid water for the heat to act upon as it leaves the furnace. In our experience we have found great difficulty with this arrangement of tubes, particularly when used with

bad water. It gives a greater area of tube surface, but a considerable portion of the surface so gained is useless, and worse than useless, from the fact that the water space is unduly taken up by the superfluous tubes. Fig. 2 shows an arrangement of tubes which is far better. The lower row is well up from the bottom of the boiler, leaving a good solid body of water for the heat from the furnace to act upon. The tubes are kept well away from the shell of the boiler on the sides, no tube being nearer than three inches to the shell, and a space of double width is provided for between the center (vertical) rows of tubes. Good circulation is obtained, and the boiler is much easier cleaned and maintained at its maximum efficiency.—[The Locomotive.

RECEIVED FROM THE TRADE.

Recently issued leaflets on the Riedler pumping engines, from the Chicago offices of Fraser & Chalmers, direct attention to the valves of these pumps and the method of closing them, which are distinguishing features. The Riedler valves permit of a lift of from 1″ to 1½″, preventing throttling and allowing the water to flow into and out of the pump chambers at uniform speed. Recent records of Riedler pumping engines are 154,000,000 foot pounds duty for triple expansion engines, Chestnut Hill, Boston, and 126,000,000 foot pounds duty for compound condensing engines, Syracuse, N. Y. These duties are much above the average with Cornish and other pumps at the iron and copper mines on Lake Superior; but the additional claim is made that the large positive-closed valves of the Riedler system permit a higher speed and greater range, at reduced size, and with special economy of fuel, regularity of operation and security against breakage.

The Q. & C. Co., Chicago, has supplemented its metal sawing machine catalogue with a recent four-page folder, which reproduces the testimony of H. D. Gordon, manager of the Pennsylvania railway shops, Altoona, Pa., to the value of the cold saw. Mr. Gordon's opinion is contained in an *Engineering Magazine* article. An October letter received from the Buchel Machine Works, New Orleans, La., is also cited by the Q. & C. Co. in which the shop saw is spoken of as indispensable in the machine shop, even where band sawing and cut-off machines are used. The Q. & C. Co. states that for its large machine, the Bryant Metal Cutting Machine xx, its orders are now in excess of its capacity.

A late booklet of Warren, Webster & Co., Camden, N. J., refers to recent refinements in its vacuum system of steam heating, securing economies in construction and operation, and preventing waste of steam and water. A list of 1895 installations of the system is also given.

The Magnolia Metal Co., New York, in an attractive 40-page catalogue, sums up the results of tests of Magnolia and other anti-friction metals in various lines of service. Photographic reproductions are made of various makes of Babbitt after being subjected to tests which are specified. The effect upon the surface of the bearings is indicated and compared with results attained with Magnolia metal. Railroad work, steamship work and rolling mill work are taken up separately in the volume and detailed results set forth.

CAR and locomotive building; Brooks Locomotive Works have begun to deliver the 10 engines ordered in July by the Lake Shore. Toronto, Hamilton & Buffalo will buy a number of passenger cars. The Nickel Plate will buy a number of box and coal cars. Illinois Central order for 1,000 cars went to the Haskell & Barker Car Co., Michigan City, Ind. Carlisle Mfg. Co., Carlisle, Pa., has a 200-car order. Central of New Jersey has ordered 500 new cars. Toledo & Ohio Central has ordered 200 box cars from the Michigan-Peninsular. The Pennsylvania Co. has placed a contract for 1,000 cars, in addition to the 2,000 ordered earlier in the year. President Roberts says the total car buying for the year will be 6,000 cars.

FURNACE A, at Sparrow's Point, was started up Nov. 12, after 22 months' idleness. It is reported that portions of the steel works may be put in operation later. At the works of the Pennsylvania Steel Co., at Steelton, Pa., the Bessemer department made more steel in October than in any month since May, 1891, and the rail mill made the largest month's product since October, 1890, with only three months since 1888 exceeding it.

LAKE SUPERIOR IRON MINES.

Season shipments of the Pioneer mine were 40,053 tons. Miners are getting $1.65 a day at this property.

The Norman mine, on the Mesabi, shipped 93,392 gross tons; the Mountain Iron range, 400,000 tons; Biwabik nearly 300,000 tons; the Auburn about 400,000 tons. The Fayal has made a total of 150,000. The Ohio has sent down some 30,000 tons. It is in shape to get out a large tonnage next season without further stripping.

It is expected that the Longyear & Bennett properties near Hibbing will be worked next year, but whether under lease or by the owners has not been determined. At one of them the ore runs 63 in iron and .030 in phosphorus.

The Tilden has made shipments of about 410,000 tons. Stockpiling for next season has begun.

There is danger of overdoing the lean ore business. Many have turned their attention to this new branch of the business. The difficulty liable to arise is too great a production of ore of this class. Nearly all mining companies have a certain amount of lean ore and they will sell this in connection with their better class, which will give them a decided advantage over the man who has only the low grade.—[Iron Ore, Ishpeming, Mich.

It is expected that considerable work will be done the coming winter at the Mountain Iron. The entrances to both cuts will be deepened and other changes made for more conveniently getting out the ore.

At the Loretto mine, on the Menominee range, the machinery will be removed from over the ore body; when this is done 100,000 tons additional will be accessible.

Some work has been done recently at the Michigamme mine, but it has been decided not to resume mining this year

The Champion is now imploying 200 men and water is being taken from the lower levels.

At the Republic, the new shaft is down 60 feet. It will be months before the desired depth is reached.

The *News-Record*, Ironwood, Mich., gives approximate shipments to Nov. 5 from Gogebic mines that send ore over the Northwestern road. To the Escanaba docks the Windsor sent 14,000 tons, the Norrie group 85,000 tons, the Palms 7,100 tons. Shipments to Ashland docks of the Northwestern were as follows: Anvil, 61,593; Brotherton, 34,904; East and West Cary, 51,623; Eureka, 26,782; Davis, 9,557; Norrie, 520,632; East Norrie, 74,511; Pabst, 194,472; Mikado, 2,426; Palms, 26,240; Sunday Lake, 14,309; Windsor, 5,457; Newport, 157,882; total, 1,180,988 tons. The total to Nov. 6 going to Wisconsin Central docks was about 1,100,000 tons. From the range the total was close to 2,400,000, with the probability that 200,000 tons will be added in lake and all-rail shipments, to make up the record of the year. The Anvil is now sending about 400 tons to the Ashland docks daily, and the Sunday Lake about 600 tons, while the Metropolitan Iron & Land Co. is sending about 2,500 tons daily to Escanaba docks and 500 tons to the furnaces at Ashland and Mayville. The Palms is also shipping to Escanaba about 600 tons daily.

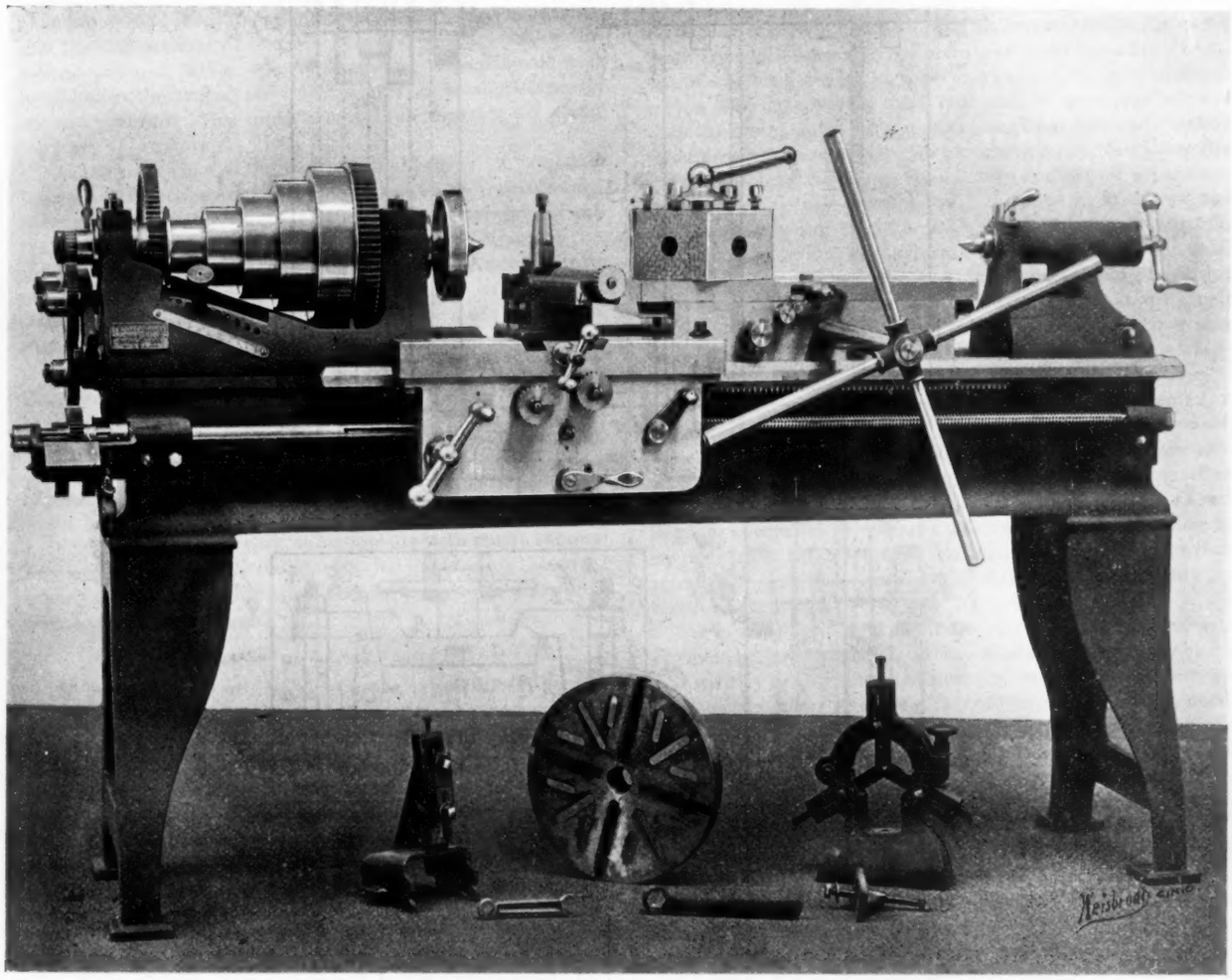
Work has been resumed with 225 men the past week at the Lillie and Cambria mines between Ishpeming and Negaunee. It is expected that the force will be increased to 400 men in a short time.

AS A result of the conference between the Amalgamated Association officers and Secretary Jarrett, of the Iron and Steel Sheet Manufacturers' Association at Pittsburg, Nov. 11, a two per cent advance in wages is announced, the record of sales in September and October warranting the increase under the wage agreement. Commissioner Nutt, of the Merchant Bar Iron Association, and President Garland are now canvassing the reports from Western bar iron mills, at Youngstown. Doubt is expressed about an advance in puddling. An average mill price of 1.30c on bar iron delivered in September and October would be necessary to secure a 25-cent increase to the puddlers.

WM. TOD & CO., of Youngstown, O., are busy on orders received some time ago, and are receiving inquiries for considerable amounts of machinery. A recent shipment of an engine was made to Bellaire, O., and two additional engines will be sent to the mills, as soon as they are ready to receive them.

SIXTEEN-INCH ENGINE LATHE.

The lathe illustrated herewith contains several special features which render it capable of a large amount of work and very quick work. The head is neat and massive. The cone pulley has five steps for a 2⅜-inch belt, with diameters of 10, 8¼, 6¾, 5 and 3¼ inches, and makes 10 revolutions while the spindle makes one—when the back gear is engaged. The spindle is of crucible steel with a 1 1-16-inch hole through it, and mounted in bearings of the best quality of bronze. The front bearing is 2⅜ inches diameter by 4 inches long; the back bearing is 1¾ inches diameter by 3 inches long; the spindle is ground in order to insure its being absolutely round and straight. The thrust collars are of steel, hardened and ground. All the change gears are of steel and are mounted on a shaft which runs in substantial bearings in the bed, directly under the head. The change gears receive their motion from the gear shown on the outer end of spindle. The carriage is made carefully to meet the hardest requirements. It is heavy and substantial, provided with liberal T slots and is gibbed to the bed its entire length.



SIXTEEN-INCH ENGINE LATHE.

The bearing on the bed is not recessed, but has a full bearing from end to end and the entire depth of V on the bed. The carriage is provided with a screw and clamp for locking it while using the cross-feed. Provision is also made to carry off either cuttings or water that may find their way onto the cross-feed screw.

The screw cutting feature has many points of excellence. The change gears are all of steel and are mounted on a short 1 3-16 inch shaft running in substantial bearings in the bed, and directly under the head stock. The knob shown in front of the head carries a gear that continually runs, either right or left; this gear may be dropped into any one of the 10 steel change gears instantly, and thus gives any one of 40 changes of speed, because, on the outer end of the change-gear shaft are four gears, into any one of which the gear shown on the lead screw may engage; no gear is removed to obtain the different threads or feeds.

The turret is hexagonal and measures 9½ inches from side to side; the face is 5 inches deep. It has a tool steel division plate with hardened locking key. A lever is provided to withdraw the locking key by hand, so that the turret may be revolved at any point of its stroke; this avoids having to move the slide back to a given point, and permits of using one or more tools, and moving them backward and forward as the nature of the work requires.

The stroke of automatic turret is 12 inches. The stroke, when automatic trip is thrown out, is 16 inches.

This machine is made by the Lodge & Shipley Machine Tool Co., Cincinnati, O., and is for sale by the Prentiss Tool & Supply Co., 62 S. Canal St., Chicago.

THE report of Receivers William Kemp and James Keenan, of the Troy, N. Y., Steel & Iron Co., has been confirmed by the court, and they have been discharged. It shows that since the receivers took charge the receipts have been $1,527,680.17 and the expenditures $1,280,768.28, leaving a balance of $246,911,89. The court allowed each of the receivers $10,000 and attorneys $8,150. The balance in the hands of the receivers, $218,688.13, is ordered transferred to the committee of the reorganized company, W. H. Rogers, J. S. Morgan, Smith M. Weed, H. G. Young and F. S. Witherbee.

THE Herman Engineering Co., of Cleveland, capital stock $100,000 has been incorporated by Ludwig Herman, Valentine Morris, John P. Cowing, A. T. Brewer and N. H. Martyn, all of Cleveland. The general object of the company is stated to be to manufacture and deal in machinery and structural work. The company will not build works but will manufacture on contract. An automatic petroleum lift, patented by Mr. Herman, will be the first machine to which the company will devote its attention. The invention can be made applicable also to the pumping of mines.

The Big Four Railroad has recently purchased of the Cincinnati Milling Machine Co. new improved heavy universal milling machines.

IMPROVED INGOT-MOLD.

Abram Reese, M. E., 511 Hamilton Bldg., Pittsburg, has been at work for a long time perfecting an ingot-mold by which he considers the problem is solved, of casting an ingot of approximately the shape of the article to be rolled. His mold, of which views are given in the accompanying cuts, is designed for casting steel ingots for the manufacture of deck beams, rails, channels and similar shapes, having a flange on either side and a central or web portion. His tests have shown that an ingot cast in approximately the shape of on I-beam, for example, can be rolled to the finished article by substantially an even reduction on both sides, while the number of passes through the rolls is considerably reduced. Previous attempts in this direction have met this obstacle.

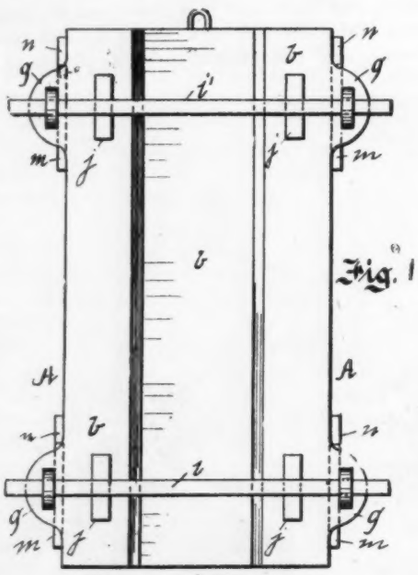


Fig. 1

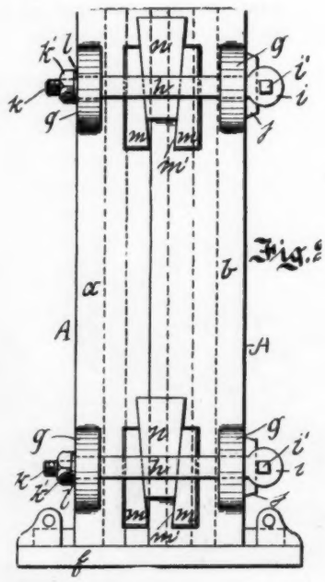


Fig. 2

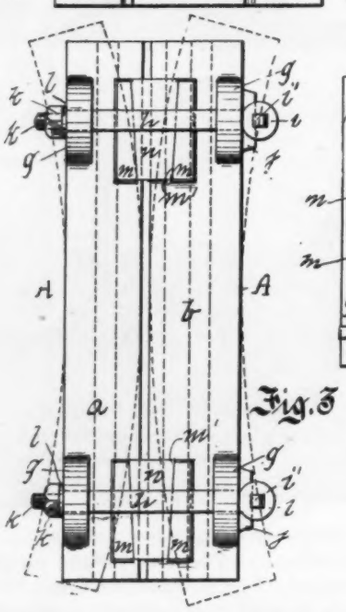


Fig. 3

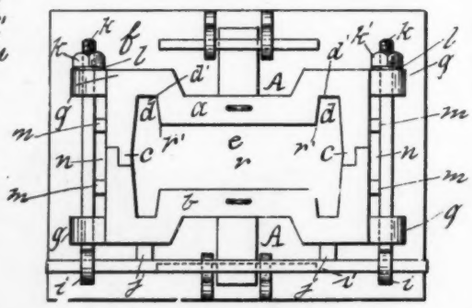


Fig 4

The parts of the mold forming the inner faces of the large cavities at each edge are expanded against the metal in the mold, and so bear against the inner faces of the enlargements of the ingot, that its normal contraction is prevented. The two opposing strains incident to the expansion of the ingot-mold and the contraction of the ingot itself produce a liability to rupture in the web. A mold which wil permit of the normal contraction of the ingot has been devised heretofore, but it was found that the contraction of the mold itself on cooling bound the ingot so tightly that it was practically impossible to remove it without destroying the mold.

Mr. Reese's mold is divided longitudinally and wedges are provided to hold the sections apart automatically, when the mold expands, and to prevent their closing together again on the cooling of the mold. Fig. 1 in the illustrations is a front view of the mold. Fig. 2 is a side view showing the position of the wedges before the metal has been poured. Fig. 3 shows their position after the metal has been poured and the mold expanded. Fig. 4 is a top view. The mold-halves *a b* overlap each other along the line of juncture, as shown at *c*, Fig. 4, so that when the metal has been poured and the mold begins to expand the mold-halves *a b* can separate to the required extent without allowing the molten metal to escape at such joints. The mold-cavity corresponds in shape to the ingot to be cast, whether for a deck-beam, I beam, channel-bar, or like article, and has the enlarged cavities *d* and the contracted space *e* between them. The mold-halves are provided with the lugs *g* and are held together by the bars *h*, passing through openings in the lugs.

The operation of the mold is thus explained by the inventor: "The mold-halves *a b* are secured together in the manner described, so that they are held firmly together. The molten steel is then poured into the mold in the ordinary manner. As hereinbefore stated, the molten steel upon coming in contact with the inner faces of the mold will at once highly heat said faces and cause them to expand or elongate before the heat has penetrated the body of the mold to cause a like elongation of the outer faces of said mold. The result of this prior expansion and elongation of the inner faces of the mold will be that the upper and lower ends of the mold-halves *a b* will diverge or be thrown back, as shown in dotted lines in Fig. 3. The central portions of said mold-halves will remain in their normal positions with reference to the ingot until the heat has penetrated the body of the mold, when the outer faces of said mold-halves will elongate and force said central portions until they are in alignment with the upper and lower ends of the mold-halves. It is apparent from the above-described construction that as the mold-halves expand and separate the resistance occasioned by the rods *i'* must be overcome. While these rods *i'* are possessed of sufficient strength to secure the mold-halves and hold them firmly together before the metal is poured, yet they are not strong enough to resist the powerful outward pressure of the mold-halves due, to the expansion of the same; but bearing, as they

do, upon the lugs *j*, the pressure of the mold-halves will be sufficient to bend the ends of the rods *i'* beyond the lugs *j* inwardly toward the mold-body.

"In this manner the separation of the mold-halves is provided for. Meanwhile, as the mold-halves *a b* are gradually forced apart by the expansion of the molds, the distance between the inclined guide-blocks *m* on said mold-halves *a b* is likewise increased, whereupon the wedges *n*, by the force of their own weight, travel automatically and exactly in accordance with the rate of expansion down the inclined faces *m'* to approximately the position shown in Fig. 3. When the mold itself begins to contract, the natural tendency is, of course, to draw the mold-halves toward each other and close in around the ingot with such tenacity as to render it practically impossible to remove the ingot without breaking the mold. However, with the wedges *n* in the position shown in Fig. 3 it is impossible for them to be forced up by the contraction of the mold, the consequence being that the mold-halves cannot close together and bind the ingot tightly therein. The high heat of the molten steel coming in contact with the mold, at once causes said mold to expand, practical experience proving that the end portions of the mold-halves separate before the central portion, while upon the further expansion of said mold-halves the central portion separates the same distance as the end portions. The mold-halves thus separate all along the lines of juncture.

"At the same time as the steel sets and begins to contract, the enlarged portions of the ingot are gradually drawn toward the contracted portions between them. The separation of the mold-halves, due to the expansion of the mold, increases the space in the mold-cavity and allows the ingot *r* to contract normally, the inner faces of the enlargements of the ingot sliding over the inner faces *d'* of the cavity *d* of the mold as the ingot contracts. It does not depend on the skill of the operator to determine to what extent to relieve the pressure of the mold-halves; but the mold-halves separate to the exact extent of the expansive force of the heat in the ingot, while the wedges act accordingly to hold the mold-halves at such distance apart as they have been forced by the expansive force of the heat in the ingot."

Mr. Reese's mold has been tested on ingots for beams up to 15 inches, and does its work automatically with entire success. Any width of beam, it is stated, can be made with this mold when used in connection with the inventor's universal mill without grooves in the roll.

Utilization of Scrap Material.

The committee on utilization of scrap, reporting to the last annual meeting of the Master Blacksmiths' Association, gives this interesting account of the Southern Pacific Railroad's method of working up old material:

In 1880 the accumulation of scrap iron at the Southern Pacific shops at Sacramento, Cal., was very important as the price of iron was higher than at present, and there was little market for the scrap. A small rolling mill with a single train of 12-inch rolls was constructed with the idea of working over the old scrap, and from the report of the foreman of the blacksmith shop it has proved very useful. Material which has been in use for some time, subject to heavy strain and severe shocks, is cut up into short lengths and stacked into 200 lb. piles. It is then placed in a blooming furnace and after being brought to the proper heat is put under a steam hammer and forged into billets or slabs. These are again cut up, repiled, and subjected to the same treatment as before. This time they are forged to the proper dimensions for use in the locomotive, car or track departments. Some of the billets are rolled into such shapes as to supply bar iron, fish plates, spikes, bolts, nuts, etc. The annual output is from 10,000 to 12,000 tons. The cost is about ½ a cent per pound. All good iron that comes in with the scrap is cut up into such lengths as is required for car repairs, etc., but all iron that has been bent to a sharp angle is worked over again. Old car axles are rolled into bars 6 in. x ¾ in. and cut up in 3 ft. 6 in. lengths. These plates are collected in sufficient quantities to make new axles. This method is considered better than flattening the old axles under a hammer, cutting them in the center and repiling them. Steel rails are converted into brake beams by plating out the head of the rail to the same thickness as the web, thus making a T section. This is then sheared to the shape required.

METHODS OF HEAT INSULATION.

The paper at the September meeting of the Engineers' Society of Western Pennsylvania, at Pittsburg, was by John A. McConnell on "Heat Insulation, with Notes on Asbestos." That portion of the paper which refers to tests with various pipe covering materials and to Mr. McConnell's method of securing greater permanency to the coverings of steam and heat pipes is reproduced below. Appended, also, is an interesting contribution to the discussion, telling how the big steam pipes between Lucy Furnaces and the Keystone Bridge Works were insulated:

Almost all the coverings now being made by reputable manufacturers are good non conductors, and the question of their relative non-conducting power is not nearly so important as is the question of permanency.

In addition to the reputed tests so largely advertised, experiments have been carried out in the engineering department of a number of our leading colleges, to determine the heat insulating power of different classes of coverings, and the results announced have been very conflicting. Most of the tests have been by condensation, in substantially the same manner as follows—from the main pipe there branches a number of smaller pipes of the same size and length, each insulated with a different covering; the free end of each pipe is lower than the main, and the water is drained from each and weighed to determine the relative condensation in a specified time, the condensation in the main pipe being drained off separately. A carefully conducted test at the University of Michigan, under the direction of Prof. Cooley, showed in favor of hair-felt. A similar test at our Pennsylvania State College showed mineral wool to be the best non-conductor; and while I have not the report I have been credibly informed that a test at Cornell University showed wool-felt lined with asbestos paper in a favorable light. In some of these tests asbestos coverings have come out ahead, and magnesia in others.

Many of these tests have been conducted by gentlemen of reputation and honor, and were doubtless thoroughly honest. My experiments have shown that different pipes, all insulated with the same material, will at times show, by condensation tests, almost as varied results as the college tests have shown in pipes covered with different materials. More water may be carried from the main with the steam into some pipes than into others, and there are so many things that may modify the result of such tests.

The average results of all these experiments, coupled with my continuous experience in the business these many years, and with 25 or 30 different varieties of material, convinces me that coverings can be made either of hair, wool, asbestos, wood-pulp, mineral wool, infusorial earth, carbonate of magnesia, chalk, gypsum, and compounds of these and other materials, that will all be so nearly alike in non-conducting power that a slight change of condition will turn the scale for or against either.

While there is question what particular covering may save a few heat units more than some other covering, there is no question about the great difference in loss from a bare boiler as compared with an insulated one.

The experiments of Peclet give the following as the conducting power per square foot of four materials, difference of temperature 1° Fahrenheit:

Copper	515 heat units per hour.
Iron	233 " " " "
Ordinary stone	13.68 " " " "
Powdered chalk	.869, or less than one heat unit.

Hence copper conducts 593 times as much heat as the chalk, iron 268 times as much, and even ordinary stone 15 times as much; hence, why should covering manufacturers quibble so much about a half dozen heat units of difference when the difference between the covering and the iron steam pipe is counted by hundreds of heat units; of course, poor non-conductors must not be used, as their necessary thickness will so increase the radiating surface as to neutralize their non-conducting power. I purposely used chalk in illustration, because it is very similar to the three materials that are being most largely used in combination with asbestos in making high temperature coverings—these are infusorial earth, carbonate of magnesia and gypsum, each dependent for its strength largely upon the asbestos incorporated with it.

Porousness is one of the necessary qualities of good non-

conductors, and this pourousness necessarily tends to weakness, hence clothing for steam pipes, like the clothing we wear, is liable to wear out. Means for counteracting this natural weakness and for making coverings permanent, is the one thing now needed. I am thoroughly convinced that there is only one practicable way to render coverings really permanent, and that is to strengthen them by reinforcing with iron. Iron can be so incorporated in the body of the covering that the atmosphere cannot reach it; the life of iron thus protected from the atmosphere is almost unlimited, and thus situated it will hold the covering in place indfinitely, making it really permanent.

I have known this a long while, but I have never been able to introduce it to the public on account of the largely increased cost; when I increase my price enough to justify this improvement, other parties get the contracts, but the paying of this additional cost is, in the end, the very best of economy, for coverings thus strengthened with iron will last five or six times as long as any of the coverings now in general use. The iron, being protected as indicated, need not be of sufficient thickness to affect the non-conducting qualities of the covering.

A high degree of permanency is attained by using one-inch thick of any of the well-known mineral coverings, and outside of this from a half inch to an inch of wool-felt paper, made into solid tubes and securely fastened over the mineral coverings.

Felt paper pipe coverings, while excellent non-conductors, have heretofore failed of permanency because they were placed so near the hot pipes that they were gradually burned up. With an inch of good mineral insulation next to the pipe, this charring weakness of the felt paper is entirely overcome, and the paper tubes being very strong will, if properly fastened, hold the magnesia, asbestos, or other mineral covering in place two or three times as long as it would otherwise remain.

Less than an inch of mineral under the paper will not protect it, hence this plan means substantially two coverings and adds materially to the cost, and I do not believe it is possible to make heat insulating coverings permanent without making the first cost more than it has heretofore been, but by increasing the cost they *can* be made permanent.

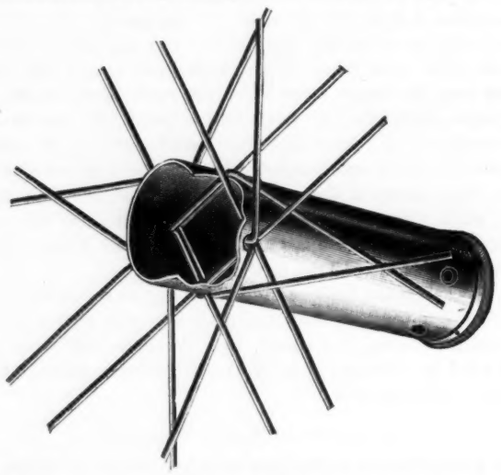
DISCUSSION.

Mr. Emil Swensson: In this connection it may be of interest to our members to give a brief description of the heat insulating covering of the large steam pipe line, which carries the steam supply of the Keystone Bridge Works from the Lucy Furnaces across the furnace stock yards and the A. V. R. R. tracks to and over the buildings of the bridge works. This line is composed of about 600 feet of 14 inch pipe and about 300 feet of 10 inch pipe and is exposed to wind and weather in its entire length, being carried about 30 feet above the stock yard floor, about 24 feet above the railroad tracks and about 22 feet above the floor level in Keystone Bridge Works. On account of the great height at which it had to be carried, it was decided to support the pipe from below, rather than to hang it up as is usually done, but how to do it and at the same time take care of the expansion and not interfere with or break the necessary heat insulating covering, now became a serious problem. To permit a free expansion movement it was decided to support the pipe in cast iron shoes resting on roller nests. But of course the shoes could not come in direct contact with the pipe without breaking the covering. The insulating materials being of a very porous nature, and consequently having small resistance to crushing, an experiment was made to test the strength of asbestos cement and its various modes of application, suitable on this line. A five foot long section of the 14-inch pipe was covered in three different manners, first similarly to the proposed covering for the entire pipe line, consisting of an air-space of one and a half inches, having five tin thimbles or studs to the square foot, holding a heavy wire netting away from the pipe; over the top of this was applied two inches thick asbestos cement in four coats. The second kind was the same as the first except that wrought iron gas pipe was used instead of tin for the thimbles at the saddle rest for a space of about 15x18 inches. The third kind was similar to the first except that the air-space for a width of 15 inches all around the pipe was filled in solidly with wired on asbestos cement. A saddle or shoe 12 inches square was placed on the various kinds of covering and loaded until the cement began crushing in. I do not now remember the different loads used on the first two kinds, but I do remember that the first ones were both two weak, the first one being the weakest. The third showed ample strength for our purpose, carrying a load of 3,200 lbs. without showing sign of crushing. As the load to be carried was about 1,000 lbs., and as the size of the shoe would be about 15x18 inches, the safety factor would be ample, especially after hardening of the cement. This last described method of construction was consequently decided upon as the one to be used at the saddles.

After the asbestos cement had been put on it was covered with canvas, sewed all around the pipe, then painted with white lead, and finally the upper two-thirds of the pipe was covered with No. 24 gauge sheet iron, wired on and painted with oxide of iron. The covering has now been on for three years and is in as good condition as when first put on. Its value as a heat insulator is best illustrated by the fact that when the uncovered pipe will burn the hand, the heat can barely be detected on the outside of the covering.

NEW TUBULAR BICYCLE HUB.

The weakest part of a bicycle, in ordinary construction, is the hub. The breaking and chipping off of heads of the spokes, accumulation of dust in the bearings, the necessity for 30 perforations corresponding to the number of spokes, each



perforation weakening the comparatively small hub or flange, the necessity of a double thread for fastening the rear sprocket and hence the possibility of weakening it on the road—these are some of the difficulties encountered. The new hub designed by the Bolte Cycle Mfg. Co., of Milwaukee, obviates the necessity of the same number of holes as of spokes and does away with the crystallization of the steel by heading the spoke. The 32-spoke wheel of this company is constructed by passing four double spokes through each of the four holes at either end of the tubular hub, thereby precluding any possibility of displacing a spoke which is screwed in the wooden rim by the ordinary nipple, or breaking a spoke whose virgin steel has never come in contact with a hammer. The narrow tread, combined with wide spread of spokes, giving firm brace to the rim, in addition to the ball cups which are of three point contact, and the use of ¼ inch balls, are prominent features. The cut shows that in avoiding hooked spokes bent at sharp angles, the old trouble of tearing the holes by high tension, as well as the danger of total displacement by a sudden jar, are avoided. The hub is made of 1¼ inch tubing. It is made complete by a device rendering the rear sprocket very secure. It is well fastened to the hub but can be easily removed.

THE South Pittsburg (Tenn.) Stove Works plant was sold at auction to Col. A. M. Shook, representing Chattanooga and Nashville capital. The purchasers hold $51,000 of the $75,000 outstanding bonds. Besides the bonds and the floating indebtedness of $6,500, the purchase price was $1,100. The original outlay was $250,000 and the capacity 90,000 stoves a year.

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INDUSTRIAL SUMMARY.

New Buyers in the Market, and Some of Their Wants:—

[If you are in need of machinery of any description, please notify *The Iron Trade Review* and we will put you in communication with our advertisers at once.]

Jesse Atherton, Auburn, R. I., wants to buy second-hand wire-nail machinery.

"J. D. W," 90 22nd st., Chicago, wants an upright boiler about 5 ft. by 26 in., for low pressure.

C. F. Roth, Ironton, O., wants 25 or 30 small cut nail machines, three, five and fourpenny, with self-feeders.

The Sullivan Machinery Co., 54 N. Clinton st., Chicago, wants to buy a second-hand lathe.

Chas. Ferris, 1105 Yale avenue, Knoxville, Tenn., is in the market for a wire-bending machine which will turn out wire U-shaped, No. 16 or 14 gauge, automatic.

The Standard Brass & Electric Co., of St. Paul, Minn., has been incorporated with a capital stock of $50,000 by J. W. Jaggar, Jacob Heilbron and Theodore Gutting.

S. E. Olin, S. Barlow and G. P. Youmans, of Galesburg, Ill., have formed a partnership for the manufacture of windmills, pumps, and a general line of foundry and machine work.

The Trenton Tool Works, of Trenton, N. J., has been incorporated, with a capital stock of $150,000, by Hughes and Richard C. Oliphant, Stephen B. Elkins, Thomas Orgill and Walter L. Clark. A factory will be erected near the city.

At the office of the Supervising Architect, Washington, D. C., sealed proposals will be received until 2 P. M., Dec. 12, for all the labor and materials required for the superstructure, roof covering, etc., at the U. S. Postoffice, Allegheny, Pa.

The Canadian Government is about asking bids for 4,000 tons of steel rails; 1,000 tons for the Prince Edward Island division, to be delivered at Summerside; and 3,000 tons for the Inter-Colonial, to be landed at Point Levis, opposite Quebec. Tenders are to be in by Dec. 17. The rails are required for renewals and repairs.

The Greer Machinery Co., Knoxville, Tenn., wants prices on motor-driven ironworking machinery, 24-inch engine lathe, eight feet between centers, 30-inch engine lathe 10 ft. between centers, and 30-inch drill press, all driven by electric motors.

The Stockham Mfg. Co., a new concern at Chicago, has purchased the brass business of Bennett & Johnson, 96 W. Lake street, and the Russell Bros. & Young iron foundry at W. 46th street and Grand avenue, Chicago, and will consolidate the two at the latter location. The company will make a specialty of finished goods, having a fully equipped machine shop. It further proposes to make all patterns that may be needed. The main office is in room 216, 52 Dearborn street.

Additions, Enlargements, Removals, Etc.:—

The Warren Foundry & Machine Co., of Warren, O., will make an extension to its works, 50x60 feet.

Anderson, DePuy & Co., proprietors of the Pittsburg Steel Works, at Pittsburg, are erecting an addition.

The Union Foundry Co., of Grand Rapids, Mich., is about to enlarge its plant and has bought 100 square feet of land.

The Follansbee Bros. Co., of Pittsburg, will enlarge its tinning house and has ordered two single tinning machines.

The Keystone Axle Co., of Baltimore, Md., has completed arrangements for a site for its axle works at Beaver Falls, Pa.

Wyckoff, Seamans & Benedict, manufacturers of the Remington typewriter, are to build a large addition to their plant at Ilion, N. Y.

The National Tube Works Co., of McKeesport, Pa., will extend its plant as soon as the National galvanizing works are removed to Versailles borough. The 24-inch mill will be

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Iron and Wood-Working Machinery

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OFFICE, 525 ROOKERY, CHICAGO.

run out and occupy the ground now used by the galvanizing works. Several new furnaces will be built.

The Sayre Metal Works, at Waverly, N. Y., are erecting an addition to the main building. The capital stock is to be increased to $100,000.

The Rogers Mfg. Co., of Canton, O., is adding a galvanizing plant to its works and it is thought that it will be in operation at a very early date.

The Dickson Car Wheel Co., Houston, Tex., is erecting a foundry 50x100 feet, two story, machine shop of the same size, blacksmith shop, core ovens, etc.

J. J. McDonough, Jno. Flannery and others have purchased the Huntington Car & Car Wheel Works, at Huntingdon, Pa., and will remove them to Savannah, Ga.

The Hardie-Tynes Foundry & Machine Co., Birmingham, Ala., which recently bought out the Birmingham Engine Works, is adding a building 100x250 feet, to be used as a machine shop.

E. C. Boyer recently purchased the Maxon screw and lifting jack patent formerly owned owned by the McSherry Mfg. Co., and manufactured at Middletown, and has moved the concern to Dayton, O. He will shortly start the plant.

Fires and Accidents:—

The roundhouse and machine shop of the Louisville, New Albany & Chicago Road at Chicago, were burned Oct. 30, loss $20,000.

An explosion at Iroquois furnaces, South Chicago, Nov. 9 seriously injured seven workmen, the burns of three being thought fatal.

At the Clinton furnaces of the Clinton Iron & Steel Co., Pittsburg, iron broke through the side of the furnace and ran into a waste water conduit causing an explosion. The hoisting engine was wrecked, with a loss of several thousand dollars. A shut-down was necessary for repairs.

New Construction:—

Wm. Beattie will build a machine shop at Cohoes, N. Y.

The Schoen Mfg. Co., of Wood's Run, Allegheny, has purchased three acres of land from the Oliver Iron & Steel Co. and will build a new plant which will double its output of pressed steel.

F. W. Miller, who is to remove his manufacturing plant from Caledonia, N. Y., to Le Roy, N. Y., has broken ground

for the new building, consisting of a main structure, a foundry, a milling department and a pattern shop.

The Atlanta Steel & Tin Plate Co., Atlanta, Ind., has just completed a two story brick building. This building, including both floors, covers 10,000 sq. ft. of floor space. The company intends using the upper floor in the near future for the manufacture of Heinig's patent can cover. The machinery for this will all be driven by electric motors.

General Industrial Notes:—

The Vulcan Foundry Co., Toledo, O., has increased wages 10 per cent.

The New Castle Wire Nail Co. has been running double turn recently.

Douglas furnace at Sharpsville, Pa., has resumed after repairs costing $60,000

After a shut-down of three months the mower and reaper works of Aultman, Miller & Co., Akron, O., started up last week.

It is stated that the Ft. Payne, Ala., furnaces and steel mill, purchased some months ago by the DeKalb Co., will be put in operation.

At Homestead, Pa., works of Carnegie Steel Co., four new open-hearth furnaces of 30 tons capacity each have recently been built.

A receiver has been appointed at Hillsboro, Ill., for the Litchfield Car & Machine Co. Assets are $75,000 and liabilities $168,000.

The Pittsburg Wire Co., Braddock, Pa., has increased its capital stock from $300,000 to $360,000, employing the new issue to increase its output.

One of the Shoenberger furnaces, of the Shoenberger Steel Co., at Pittsburg, is idle for relining and repairs. It will be ready for blast early in December.

The Canonsburg Architectural Iron Works, at Canonsburg, Pa., are in the hands of the sheriff on judgments in favor of the U. Baird Machinery Co., of Pittsburg.

The Blue Ridge iron mines, 12 miles from Roanoke, Va., have been leased to the Pulaski Furnace Co., and preparations are making for their immediate operation.

At the American Tin Plate Co.'s plant, Elwood, Ind., a strike has been in progress in the cold roll department and new men are being introduced. The old men claim that they should be paid on the basis of the output of their department and not on the number of boxes of finished plate turned out, contending that the waste should not be made to count against them.

Furnace No. 2, of the Crozer Iron Co., Roanoke, Va., has recently been put in blast. At the West End furnace repairs are about completed and it will go in blast soon.

A number of improvements are to be made at the Youngstown mill of the Union Iron & Steel Co., and the muck mill, squeezers, 10-inch and guide mills will be idle for three weeks.

The Pennsylvania Bolt & Nut Co., Lebanon, is now employing 1,300 men and is doing the largest business in its history. It is building an important extension and adding new machinery.

Structural iron workers at Pittsburg are organizing and will affiliate with the national association. Cleveland members of the same craft have had meetings also with a view to getting together.

At Alexandria, Ind., the Union Valley plant is increasing its force and finishing the plant. The strike in the sheet mill department ended in the company discharging the non-union men complained of.

The Cumberland Iron & Steel Shafting Co., of Cumberland, Md., reports a good demand for turned and ground shafting. Patents on the special machinery used in its operations are owned by the company.

H. F. Holloway, president of the Akron Iron & Steel Co., Akron, O., has reported on the accounts of Receiver J. A. Long, of the Akron Iron Co., and the court allowed $15,000 as compensation for the receiver's services.

The Laidlaw-Dunn-Gordon Co., Cincinnati, has just contracetd to furnish a complete hydraulic pumping outfit to a firm in Manchester, Eng., at a price lower than that made by the largest hydraulic machinery concern of Liverpool.

John Adt & Son, Franklin B. Schuster, proprietor, of New Haven, Conn., is building a wire straightening and bending machine which is even larger than the large machine made recently for Holmes, Booth & Haydens of Waterbury, Conn.

A powerful multiple punch has just been shipped by the Long & Allstatter Co., of Hamilton, O., to the Deering Harvester Co. It punches 30 oval holes 13 16 inches, 29 square holes 7-16-inch, and four 9 16-inch round holes in a ⅜-inch high carbon steel.

A manufacturer of the Birmingham district has made a proposition for the operation of the Tallapoosa, Ga., charcoal

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If the direction printed on each package is carefully observed, the Eureka Coal Economizer will give to any ordinary or middling coal the same value as that of superior quality.

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The "Eureka" burns any kind of gas which might destroy the breathable air; apartments and factories in which it is used are consequently more healthy and comfortable. In less than five minutes, one can obtain a very brisk fire which will last 30 hours without being stirred up and without any addition of fresh coal. Hence an ECONOMY OF COAL, WORK AND MONEY.

The "Eureka" Economizer produces a heat more soft and more concentrated. Each package is sufficient for treating a ton of coal.

We guarantee that our preparation produces no injurious effect on the health, and does not affect in any way stoves, ranges, grates, etc.

The "Eureka" Fuel Economizer is sold in packages at 25 cents.

Large consumers can obtain this product, which we do not hesitate in terming "marvelous" at much more reduced prices.

Any counterfeiter shall be dealt with according to law.

The moderate price of our product is at the reach of anybody who wants to try it. It is for the same reason that we have decided to send it direct on the receipt of 25 cents.

To try it is to be convinced that our product is a triumph of Science.

25 cents each package, sent free of charge.

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ONE YEAR, $3,

THE IRON TRADE REVIEW.

furnace if the logging road is completed. If accepted, $15,000 will be expended to rebuild the furnace, add new air-blowing engines, heating stoves, etc.

The Detroit Steel & Spring Co. has been running its 9-inch mill steadily with three eight-hour shifts. The 18-inch mill has been idle for a month pending the installation of a new Reynolds-Corliss 500 h. p. engine. The train is also being extended, making a three-high modern mill.

At Ironton, O., McGugin & Co., proprietors of Olive furnace have sued the C. H. & D. road for $50,000 damages, alleging that the defendent failed to build switches convenient to Olive and Buckhorn furnaces and to do other things promised in return for rights of way and other privileges.

At Wheeling, W. Va., articles of incorporation were filed for the Brilliant Tube and Pipe Works. The stock subscribed is $60,000. The incorporators are. J. R. Jackson, of New York; Thomas Hackett, of Pittsburg; Joseph Speidel, W. B. Simpson, W. F. Stifel and George K. Wheat, of Wheeling.

The strike of molders at the Lynn, Mass., foundry of the General Electric Co., promises to be long drawn out. Vice-President Valentine, of the molders' union, says the union men will never work on the piece-work plan. Of the strikers, the union officers say that only 38 are left, the others have secured work in other shops. The General Electric Co. is working a force of non-union men.

Ohio Day at Atlanta.

Wednesday, Dec. 4, is to be Ohio Day at the Atlanta Exposition. State officials and a large military contingent will attend and delegations from all over the State are expected. The Queen & Crescent Route makes a low round trip rate. Its Exposition flyer which leaves Cincinnati at 9:15 P. M. runs through to Atlanta solid without change. The day train leaves Cincinnati at 8 A. M. and reaches Atlanta at 10:40 P. M. the same day.

EXCURSION SOUTH.

Lower Rates to Atlanta via Pennsylvania Lines.

Three forms of excursion tickets to Atlanta account the Cotton States Exposition are for sale via Pennsylvania Lines. One ticket is good returning 20 days from date of sale, another is good for return trip until January 7, 1896, and a third good returning 10 days. Twenty day tickets and those good to return until Jan. 7 may be obtained any time during the Exposition. The 10 day tickets will be sold only on Oct. 26, Nov. 5, 15 and 25, and Dec. 5 and 16, at special low rates. The fare is exceptionally cheap. For details, apply to nearest ticket agent of Pennsylvania Lines or address C. L. Kimball, Ass't Gen. Pass. Agent, 149 Superior street, Cleveland, O.

The Southern Railway Building at Atlanta.

One building at the Cotton States and International Exposition that in its pure white exterior, its gilded dome, surmounted by a female figure, and the symmetry of its design suggests the White City, is that of the Southern Railway Co. It was constructed under the immediate supervision of the railroad management and represents the best work of the architect, Bradford L. Gilbert. An interesting exhibit is given within of the best of the mineral and vegetable products of districts touched by the great system that spreads over practically the entire South. A big block of red iron ore near the entrance to the building bears a placard with the information that ore like it can be put on cars at 35 cents a ton. The display of rare minerals within the building and of nearly every kind of fruit raised in the South is highly creditable and instructive. Two bureaus are maintained at the building, one under the auspices of the passenger department and the other directed by the land and immigration department.

The Southern Railway has done what the Illinois Central did at the World's Fair, in providing a quick train service between a down-town point in Atlanta and Piedmont Park. These trains are arranged to run within three minutes of each other, landing their passengers within the grounds, the facilities being such that 20,000 could be so transported in a single hour. For the transportation of Northern visitors to Atlanta special arrangements have been made by the Southern Railway Co. From Cincinnati to Atlanta, in connection with the Queen & Crescent, it offers the shortest line, and solid vestibuled trains starting from Cincinnati run through to Atlanta in less than 15 hours.

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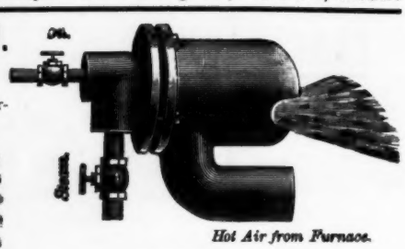

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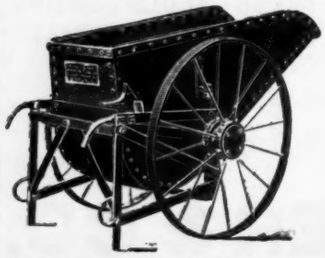

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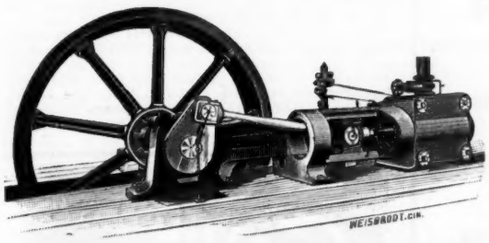

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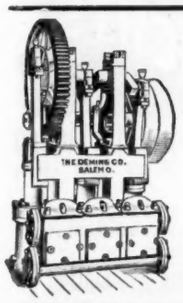

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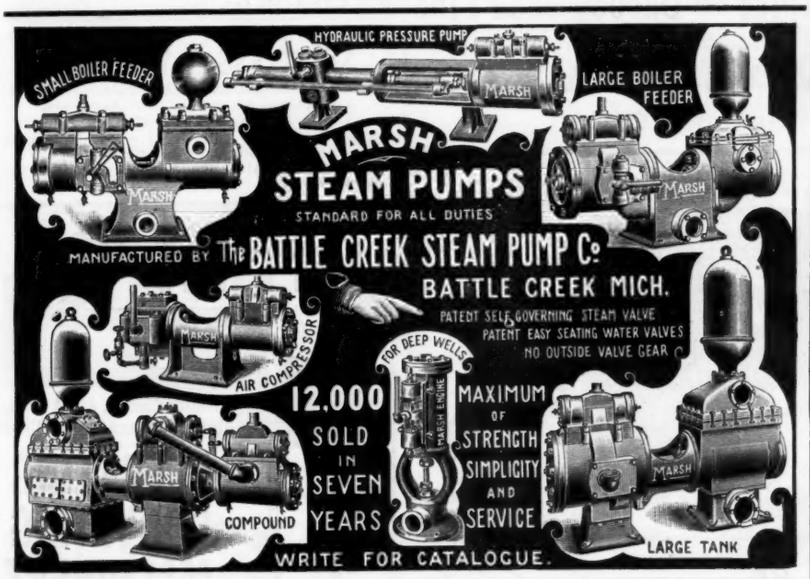

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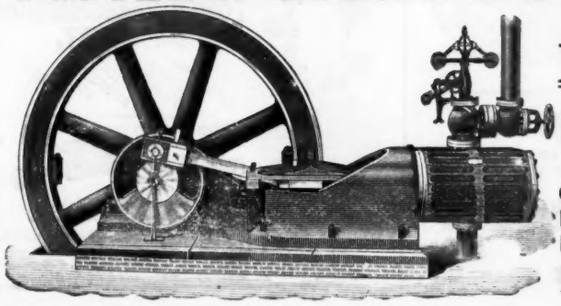

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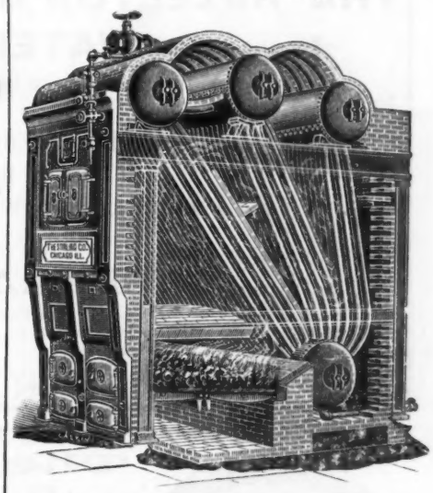

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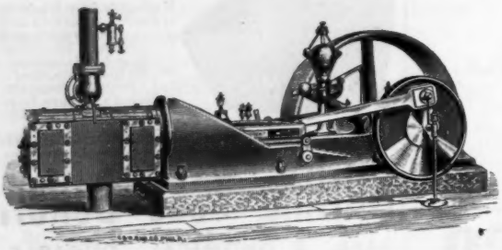

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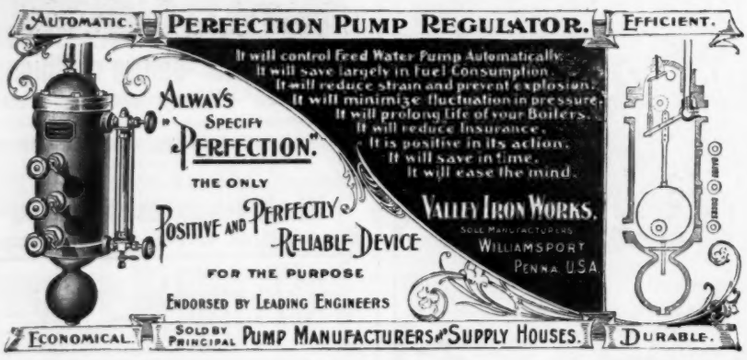
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SOLE MANUFACTURERS
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ENDORSED BY LEADING ENGINEERS
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No Steam, Coal, Ash, Gauges, Engineer nor Danger.

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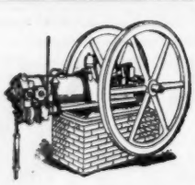

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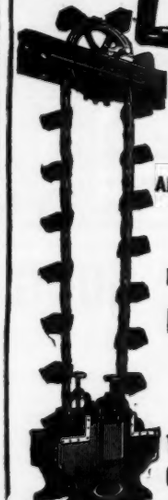

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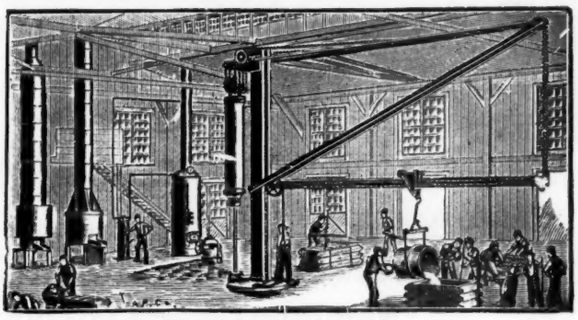

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Are the same moulders able to turn out 50 per cent more work with the same wages with this crane than with any other? Are the foundries who are equipped with these cranes the largest and most progressive in the land?

Are the best mills and foundries everywhere getting these cranes?

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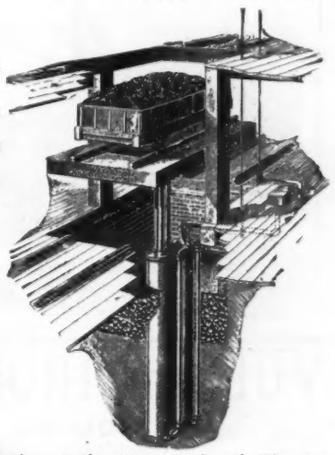

Direct Acting Steam-Hydraulic Elevator.

"Please Take the Elevator."

GREATEST MACHINE FOR THE PURPOSE THERE EVER WAS.

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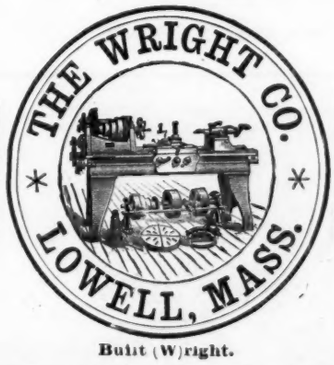
LATHES

Work (W)right.



Designed (W)right.

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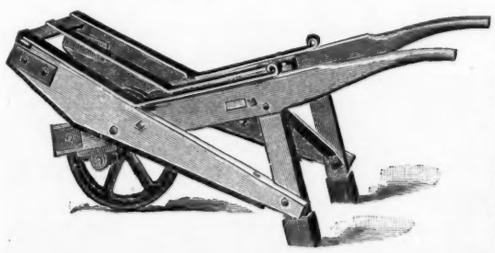
PITTSBURGH OPEN HEARTH BARROW



Weight 160 lbs. The heaviest and strongest barrow made. Ironed with half inch iron. Cast iron shoes bolted on legs. The only barrow that will stand carrying pig iron or billets. It will be noticed by referring to dimensions below that the barrow, though so heavy, is very compact, so the load is easily managed. Furnished with 40 lb. Cast Iron Wheel.

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For GASOLINE or OIL.

Especially adapted for DOCK and outdoor use, as well as for lighting manufacturing establishments, such as Rolling Mills, Foundries, Machine Shops, Engine rooms, etc., etc, being a

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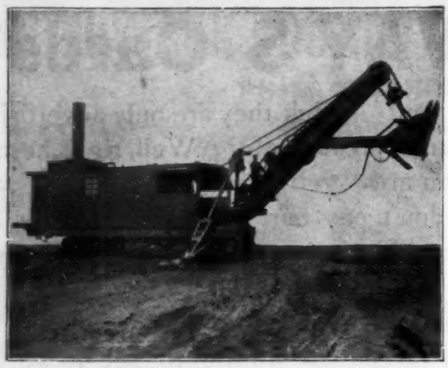

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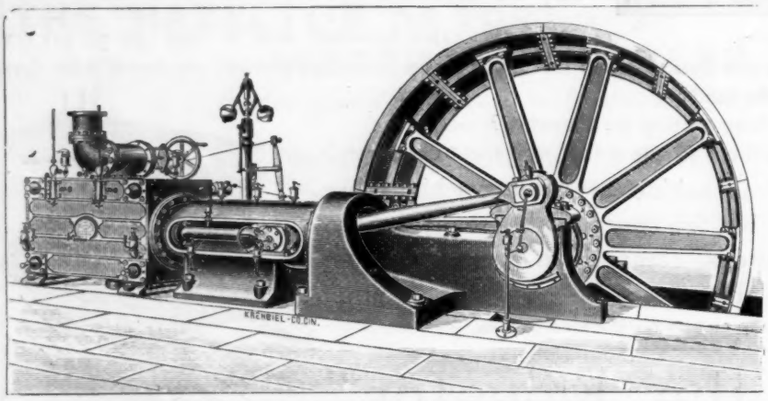

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Capacity 1 500 cu. yds.

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LOOK AT THIS!

Sample piece of FLUE taken from Locomotive No. 725 running for 7 months on Western Division of N. Y. C. & H. R. R. R. showing amount of SCALE adhering in that time.

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Delivered free to any Railroad Station in the United States. Should we not be represented in your town, and should you be well up in the machinery line, we are looking for agents.

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All sizes carried in stock by The W. Bingham Co., Cleveland, Ohio.

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Three 2-flue boilers, 40 inches by 20 feet, complete with mud and steam drum, breeching, etc. Also one 60 H. P. Engine with 8-foot fly-wheel, all complete. This plant was taken out about two years ago on account of its being too small. They are all in first class condition, and can furnish boiler inspectors' certificate.

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MALE HELP.

WANTED.—Hardware and mill supply salesmen to handle a new mechanical water-tube boiler cleaneras a side line. Liberal commission Address **President, Box 588, Pittsburg, Pa.**

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By the use of John Adt's Aut. Wire Straightening and Cutting Machines, Elastic Rotary Blow Riveting Machines and Tools, we have raised the standard of our work and increased our sales, for by their modern construction and time saving devices, the great production and good quality of work has enabled us to quote prices by which our customers would buy in large quantities.

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Others say they would have none other than John Adt's Machines and Tools. (This is the good news we are continually receiving.)

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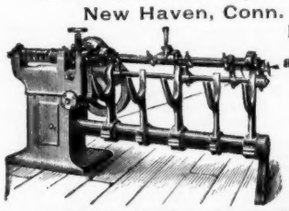

Automatic Wire Straightening and Cutting Machine.

N. B. In addressing be sure and mention Dept. C.

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Suitable for any kind of manufacturing; equipped with 35 H. P. engine and 80 H. P. boiler and line shafting ready to steam up and run.

Main building one story, 60 x 150 feet, with additional engine room, dry house, warehouse and store room, all in first-class condition, situated along the Pennsylvania and Big Four Railroads, with switch connections.

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We have on hand for immediate delivery, an iron roof 121' 3" wide out to out by 220' long, which until lately has been used over a Foundry It is in good condition. The roof covering, which will be new, can be supplied to suit the requirements of the purchaser. The length of roof can be varied slightly either way.

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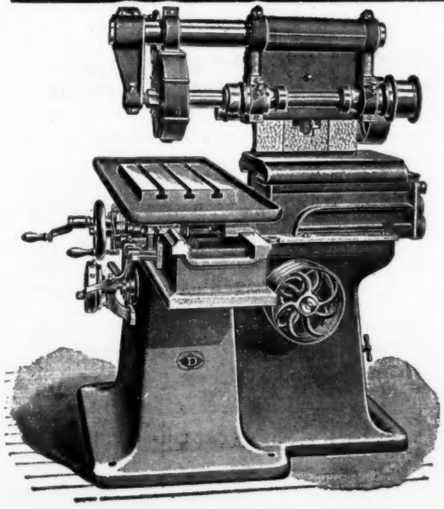

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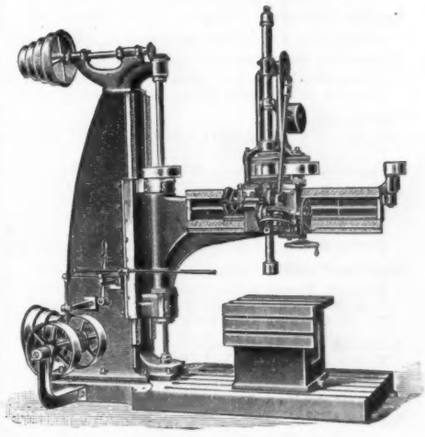

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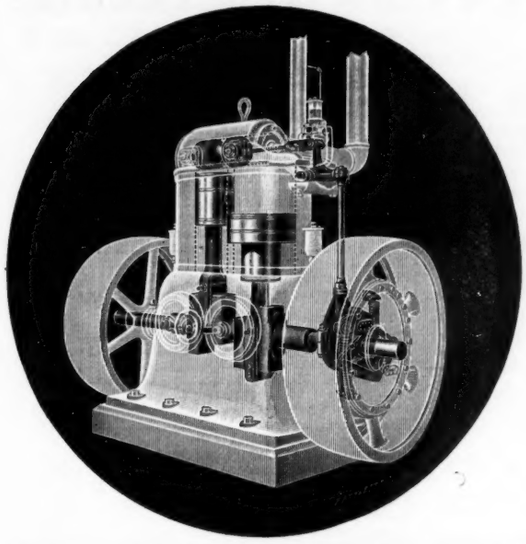

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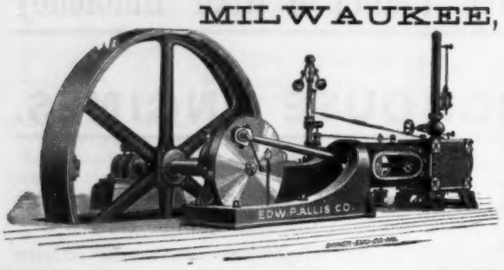

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No. 2 Gray Forge, neutral	12 75@ 13 00
No. 1 American Scotch	15 75
No. 2 American Scotch	15 25
Lake Superior Charcoal	15 50@ 16 00

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No. 2 Foundry	14 00@ 14 50
Gray Forge	12 75@ 13 00
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Local Coke Foundry No. 2	14 50@ 15 00
Local Coke Foundry No. 3	14 00@ 14 50
Local Scotch Foundry No. 1	15 00@ 15 50
Local Scotch Foundry No. 2	14 50@ 15 00
Local Scotch Foundry No. 3	14 00@ 14 50
Southern Coke No. 1	10 70@ 11 00
Southern Coke No. 2	14 00
Southern Coke No. 3	13 65
Southern No. 1 Soft	14 15
Southern No. 2 Soft	13 90
Southern Silveries No. 1	15 25@ 15 75
Southern Silveries No. 2	15 15
Jackson Co. Silveries	15 50@ 16 00
Ohio Silveries No. 1	15 00@ 15 50
Ohio Silveries No. 2	14 50@ 15 00
Ohio Strong Softeners	15 00@ 15 50
Alabama Car Wheel	17 00@ 17 50
Malleable Bessemer	
Coke Bessemer	

CINCINNATI (reported by Rogers, Brown & Co.)

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Southern Coke No. 2 and No. 1 Soft	12 75@ 13 00
Hanging Rock Coke, No 1	12 50@ 13 50
Hanging Rock Charcoal No. 1, Fdy	16 00@ 17 00
Tennessee Charcoal No 1	14 00@ 14 50
Jackson County Silvery No 1	14 00@ 15 00
Southern Coke, Gray Forge	12 50
" " Mottled	12 25@ 12 50
Standard Alabama Car Wheel	15 75@ 16 25
Tennessee " "	14 50@ 15 00
Lake Superior " "	15 50@ 16 50

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Lake Superior Charcoal	16 25
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Southern Coke No. 3	13 00@ 13 25
Southern Gray Forge	13 00@ 13 25
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Missouri Charcoal No. 1	14 00@ 15 00
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	Gross Tons
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1¾ to 6 by 1½ to 2 inch	1 80
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1" & 1⅛ by ⅜ to ¾ inch	1 70
⅛, ¾, ⅞, by ⅜ to ⅞ inch	1 80

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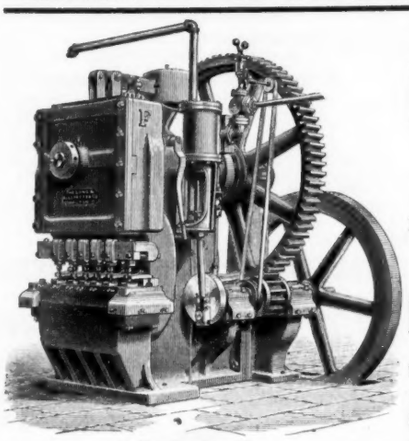


Splice Bar Punch.

—THE—

Long & Allstatter Co.

HAMILTON, O., U. S. A.

Manufacturers of Belt, Steam and Electrically driven

POWER PUNCHES and SHEARS,

for all kinds of Boiler, Tank and Structural Iron Work, Rolling Mills, Locomotive Shops, Car and Wagon Shops, Plow Shops, etc. Send for Catalogue.

A. H. LEITCH, PREST. JOHN C. LEITCH, SEC. AND TREAS.

WESTMORELAND FIRE BRICK CO.

MANUFACTURERS OF HIGH GRADE FIRE BRICKS.

PITTSBURG, PA.

Works and Mines, Westmoreland, Pa.

PL

DIXON'S PERFECT LUBRICATING GRAPHITE.

The most Marvelous Lubricant Known.
Used Dry, or Mixed with Water, Oil or Grease

NOT AFFECTED BY HEAT, COLD, STEAM OR ACIDS.

An Interesting and Instructive Pamphlet will be sent Free of Charge.

JOS. DIXON CRUCIBLE CO. Jersey City, N. J.

IRON CLAD PAINT CO.

Factory, 75 & 77 Central Way. Sec. & Treas., No. 3 Case Build'g,

CLEVELAND, OHIO.

Trade Mark Patented.

ORDER DIRECT FROM THE

Iron Clad Paint Co.

And get the genuine article, and save liability of suit for using an article made in violation of the patents issued to Wm. Green, and now owned by this Company.

IRON CLAD PAINT is the most durable, most fire-proof and Cheapest Paint made.

FURNISHED both Dry and Ground in Oil

USED BY NEARLY ALL THE RAILROADS.

Round and Square.

1 to 1⅞ inch	1 90
2 to 2⅝ inch	1 80
2¾ to 3¼ inch	1 75
3⅜ to 4 inch	2 10
4¼ to 4½ inch	2 70
4¾ to 5 inch	2 90

Oval.

⅞ to 1¾ inch	1 80
⅝ to ¾ inch	1 80
½	2 00
⅜	2 20

Half Oval and Half Round.

1⅛ to 3 inch	2 15
⅞ to 1⅛ inch	1 95
⅝ to ¾ inch	2 20
½	2 35
⅜	3 45

Heavy Band.

1¾ to 6 by ¼ and 5-16 inch	1 70
1 to 1⅜ by ¼ and 5-16 inch	1 75
¼ to ⅞ by ¼ and 5-16 inch	1 85
½ to ⅝ by ¼ and 5-16 inch	2 10

Hoop Iron.

1 7-16 to 4, No. 13, 14, 15 and 16	2 15
1 7-16 to 2, No. 17, 18 and 19	2 20
1 7-16 to 2, No. 20	2 30
1 7-16 to 2, No. 21	2 40
1 7-16 to 2, No. 22	2 50
1⅛ to 1⅜, No. 13, 14 and 15	2 20
1⅛ to 1⅜, No. 16, 17 and 18	2 25
1⅛ to 1⅜, No 19 and 20	2 30
1⅛ to 1⅜, No. 21	2 40
1⅛ to 1⅜, No. 22	2 50
15-16 and 1 inch, No. 13, 14 and 15	2 15
15-16 and 1 inch, No. 16, 17 and 18	2 30
15-16 and 1 inch, No. 19 and 20	2 40
15-16 and 1 inch, No. 21	2 50
15-16 and 1 inch, No. 22	2 60
⅞, No. 13, 14 and 15	2 40
⅞, No. 16, 17 and 18	2 50
⅞, No. 19 and 20	2 60
⅞, No. 21	2 70
⅞, No. 22	2 80
13-16, No. 13, 14 and 15	2 50
13-16, No. 16, 17 and 18	2 60
13-16, No. 19 and 20	2 70
13-16, No. 21	2 80
13-16, No. 22	2 90
¾, No. 13, 14 and 15	2 60
¾, No. 16, 17 and 18	2 75
¾, No. 19 and 20	2 85
¾, No. 21	2 95
¾, No. 22	3 05
11-16, No. 13, 14 and 15	2 85
11-16, No. 16, 17 and 18	2 93
11-16, No. 19 and 20	3 00
11-16, No. 21	3 10
11-16, No. 22	3 20
11-16, No. 23	3 30
⅝, No. 13, and 15	2 90
⅝, No. 16, 17 and 18	3 00
⅝, No. 19 and 20	3 10
⅝, No. 21	3 20
⅝, No. 22	3 30
⅝, No. 23	3 40
9-16, No. 13, 14 and 15	3 10
9-16, No. 16, 17 and 18	3 20
9-16, No. and 20	3 30
9-16, No. 21	3 40
9-16, No. 22	3 50
9-16, No. 23	3 60
7-16 and ½ inch, No. 13, 14 and 15	3 30
7-16 and ½ inch, No. 16, 17 and 18	3 40
7-16 and ½ inch, No. 19 and 20	3 50
7-16 and ½ inch, No. 21	3 60
7-16 and ½ inch, No. 22	3 70
7-16 and ½ inch, No. 23	3 80
⅜, No. 13, 14 and 15	3 80
⅜, No. 16, 17 and 18	3 90
⅜, No. 19 and 20	4 00
⅜, No. 21	5 31
⅜, No. 22	4 40
⅜, No. 23	4 55

Light Band.

1⅛ to 6 by ⅛ to 3-16 inch	1 90
1⅛ to 6 by Nos. 11 and 12	1 95
1 to 1⅜ by ⅛ to 3-16 inch	1 95
1 to 1⅜ by Nos. 11 and 12	2 00
⅞ and 13-16 by ⅛ to 3-16 inch	2 10
⅞ and 13-16 by Nos. 11 and 12	2 15
¾ and 11-16 by ⅛ to 3-16 inch	2 20
¾ and 11-16 by Nos. 11 and 12	2 25
⅝ and 9-16 by ⅛ to 3-16 inch	2 35
⅝ and 9-16 by Nos. 11 and 12	2 40
½ by ⅜ to 3-16 inch	2 50
½ by Nos. 11 and 12	2 55

Wagon Box Iron.

⅞ inch, beveled edge, by Nos. 11 and 12	2 10
⅞ inch, " " " 13 and 14	2 20
¾ inch, " " " " 11 and 12	2 25
¾ inch, " " " " 13 and 14	1 55

Sheet Iron.

No. 10	2 10
No. 12	2 20
No. 14	2 25
No. 15-17	2 35
No. 18	2 50
No. 20	2 65
No. 22-24	2 75
No. 25.26	2 85
No. 27	2 95

Steel Boiler Plates—1-4 in. and Heavier.

Tank	2 00
Shell	2 15
Flange	2 25
Marine Flange	2 60
Fire Box	3 70

Above includes plates 90 inches wide.

90 to 96 in. wide	½c. lb. extra
96 to 100 in. wide	1 c. "
100 to 104 in. wide	1½c. "
104 to 106 in. wide	special

American Cast Tool Steel.

ROUND, SQUARE AND OCTAGON.	cts.	lbs.
1 to 2 in. inclusive	08	
9-16 to ⅞ in. "	08½	

ÆTNA-STANDARD IRON AND STEEL COMPANY,

BRIDGEPORT, OHIO,

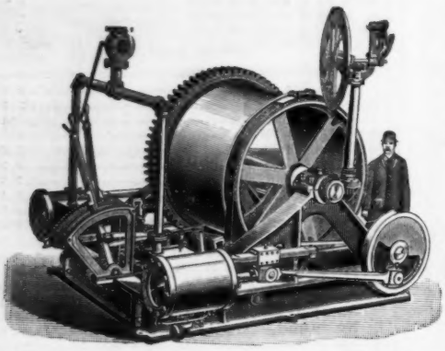
MANUFACTURERS OF

TIN AND TERNE PLATE, Iron and Ste Plates and Sheets, Plain Black, Painted, Corrugated and other forms of ROOFING, SIDING and CEILING. Patent Leveled Galvanized Sheets, BARS, Light Section Rails, ANGLES, Tees, Channels, and other Miscellaneous Bars and SHAPES.

WITH SUCH DIVERSITY OF PRODUCT,

SPECIAL ADVANTAGES are offered buyers of mixed lots, effecting saving in freight charges and by reason of our LARGE STOCKS, securing **PROMPT SHIPMENT.**

INQUIRIES INVITED AND CATALOGUES MAILED ON APPLICATION.



HOISTING MACHINERY for Mining, Quarrying, Coal Handling, Pile Driving, Bridge Building, Log Hauling and for general Contractors' Use. Improved Electric Hoists, single and double Patent Friction Drum, compound, geared with brakes and reversible for general Hoisting, Mining Purposes and Suspension Cable Ways.

Send for **Illustrated Catalogue** giving full description, etc.

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117-123 Poinier St.,

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COMBINE SAFETY WATER TUBE BOILER

L. M. MOYES, MANUFACTURER, PHILADELPHIA, PA.

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GENERAL FACTORS AND SHIPPERS OF

POCAHONTAS FLAT-TOP COKE.

So low in ash that it requires no fluxing for foundry purposes. Our foundry and furnace coke was awarded the first premium at the World's Fair in 1893.

AVERAGE ANALYSIS OF COKE.

Moisture	00.196	Sulphur	00.677
Fixed Carbon	93.625	Ash	05.004
Volatile Matter	00.494		

Foundry, Furnace and all sizes of crushed coke. Guaranteed lower in Sulphur than any other commercial coke

STEEL CASTINGS

OF EVERY DESCRIPTION

Made from Best Open-Hearth Steel.

SEND FOR ESTIMATES.

THE JOHNSON COMPANY, Johnstown, Pa.

Compare the analysis of the clay used in our.....

"O.K." CROWN

High Grade Fire Brick, with that used by **ANY** other Fire Brick-maker, and you will understand why, they have stood the **TEST** for **TWENTY-TWO LONG YEARS**

Our Prices are Just ...Right...

OAK HILL FIRE BRICK AND COAL CO.

MANUFACTURERS

OAK HILL, OHIO

7-16 to ⅜ and 2⅜ to 3 in	.09
3⅛ to 4 in	.09½
⅜ to 11-16 and 4½	.10
⅛ to 6 in	.10¼
¼ to 9-32 and 6¼ to 7 in	.11
7 ⅛ in	.13

Flats.

	cts. ℔s
2 to 9-16 in. wide by 2 to ⅝ thick	.8

Bessemer and O. H. Steel.

Bessemer Machinery	base price,	1 50
Open-hearth Tire	"	1 80
Open-hearth Spring	"	2 20
Sleigh Shoe	"	1 90
Toe Calk	"	2 10
Cutter Shoes, tapered and bent	"	2 20

English Tool Steel.

Jessop's	15½c
Hobson's "Best"	15¼c
" "Choice"	35c

Burden Boiler Rivets.

½, ⅝, 11-16 and ¾ inches diameter	3 30
Bridge ½, ⅝, 11-16 and ¾ inch diam	3 00

Wrought Pipe and Boiler Tubes.

Lap weld black, base		dis. 65
Butt " " "		dis. 55
Lap " galv. "		dis. 5
Butt " " "		dis. 50
Boiler tubes 2¼" and smaller		dis 62½
Boiler tubes 2½" and larger		dis. 65
Casing screw and socket joint		dis. 52½
Casing inserted joint		dis. 47½

MACHINERY SUPPLY MARKET.

Anvils.

American	℔ 9@10
Wright's	℔ 12

Bellows.

Blacksmiths'	Hill's	dis 40
	Bullock's	dis 50&10
Moulders'		dis 40@40&10
Hand		dis 40&10@50

Belting.

Boston Belting Co.'s standard	dis 70
" " " extra	dis 60&5
" " " best	dis 55
Cleveland Rubber Co. extra standard	dis 60&10
Hoyt's Short Lap	dis 45
Shultz Raw Hide Leather Belting, single	dis 40
Munson's Short Lap Single Leather	dis 50
Munson's Short Lap Double and Light Double Leather	dis 50&10
Shultz Raw Hide Leather Belting, Double and Light Double	dis 40
Standard, oak tanned	dis 50&10
Alexander Brothers' pure oak tanned	dis

Blowers and Exhausters.

B. F. Sturtevant's	dis 20
Boston Blower Co.,	dis 35
Buffalo	dis 40

Chucks.

Cushman's 4 Jaw Independent	dis 45
" Combination	dis 40
" Geared Scroll	dis 30
" 2 Jaw Brass Workers	dis 30
" Drill	dis 35
Wescott's Scroll Combination	dis 33⅓
" Independent	dis 40
" Little Giant Drill	dis
Horton's Universal	dis
" Independent	dis 45
Whiton's Independent	dis 45
National Combination	dis 40
Sweetland "	dis 40
Almond Drill	dis 20
Morse "	dis 15
Skinner's Combination Lathe	dis 40&10
" Independent Lathe	dis 40&10
" Universal Lathe	dis 40&10
" Drill	dis 20

Cutters and Reamers.

Cleveland	dis 10@15
Pratt & Whitney	dis 10@15
Standard	dis 10@15
Morse	dis 15
Brown & Sharpe, Milling Cutters	dis 15
" " Gear Cutters	dis 15

Crowbars.

Cast Steel	℔ 3½
Iron, steel points	℔ 1b 3

Drill and Drill Sockets.

Twist Drills	dis 50&10
Morse Taper and Straight Shank to 1⅛"	dis 50&10
Morse Taper and Straight Shank Larger than 1⅛"	dis 25
Drill Sockets	dis 25
Standard Twist Drills	dis 55@55&5
Cleveland " "	dis 55@55&5

SHIFFLER BRIDGE COMPANY,

BUILDING DEPARTMENT.

SPECIALTIES: STEEL AND IRON BUILDINGS FOR ROLLING-MILLS TIN PLATE PLANTS, STEEL WORKS, FOUNDRIES, FACTORIES, ROOF TRUSSES, GIRDERS, COLUMNS, BEAMS, CORRUGATED IRON, ETC.

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228 Lumber Exchange, Minneapolis, Minn.

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ONE THOUSAND MILES OF LAKE RIDE AT SMALL EXPENSE.

Visit this Historical Island, which is the grandest summer resort on the Great Lakes. It only costs about $13 from Detroit; $15 from Toledo; $18 from Cleveland, for the round trip, including meals and berths. Avoid the heat and dust by traveling on the D. & C floating palaces. The attractions of a trip to the Mackinac region are unsurpassed. The island itself is a grand romantic spot, its climate most invigorating. Two new steel passenger steamers have just been built for the upper lake route, costing $300,000 each. They are equipped with every modern convenience, annunciators bath rooms, etc., illuminated throughout by electricity, and are guaranteed to be the grandest, largest and safest steamers on fresh water. These steamers favorably compare with the great ocean liners in construction and speed. Four trips per week between Toledo, Detroit, Alpena, Mackinac, St. Ignace, Petoskey, Chicago, "Soo," Marquette and Duluth. Daily between Cleveland and Detroit, and Cleveland and Put-in-Bay. The palatial equipment makes traveling on these steamers thoroughly enjoyable. Send for illustrated descriptive pamphlet. Address A. A. SCHANTZ, G. P. A., D. & C., Detroit, Mich

Cleveland Union Station.

Pennsylvania Lines.

Foot of Bank Street.

TICKET OFFICES at Station, Euclid Av., Woodland Av., and Weddell House corner.
THROUGH TRAINS RUN AS FOLLOWS BY CENTRAL TIME
* Daily. † Daily, except Sunday.

	LEAVE	ARRIVE
Pittsburgh and Bellaire	† 7:00 am	†12:10 pm
Salem and Pittsburg	* 8:00 am	* 8:30 pm
Pittsburgh, Bellaire and East	†12:45 pm	† 6:25 pm
Philadelphia and New York	* 1:40 pm	*11:25 am
Baltimore and Washington	* 1:40 pm	*11:25 am
Alliance and Pittsburgh	* 1:40 pm	*11:25 am
Ravenna and Alliance	† 3:25 pm	† 9:50 am
Hudson and Ravenna	* 5:00 pm	* 8:25 am
Philadelphia and New York	*11:10 pm	* 5:25 am
Baltimore and Washington	*11:10 pm	* 5:25 am
Alliance and Pittsburgh	*11:10 pm	* 5:25 am

Mt. Vernon and Pan-Handle Route

FROM CLEVELAND TO	LEAVE	ARRIVE
Xenia and Cincinnati	* 8:40 am	* 5:15 pm
Akron and Columbus	* 8:40 am	*5:15 pm
Akron, Columbus & Zanesville	†12:45 pm	†12:10 pm
Akron and Orrville	† 3:25 pm	† 9.50 am
Columbus and Cincinnati	* 8:00 pm	* 6:55 am

The Cleveland Terminal & Valley R. R Co.

Depot foot of So. Water St.
City Office 137 Superior St.

	Arrive.	Depart.
Valley Jctn. & Way Stations	*6:30 P M	*7:10 A M
Akron, Canton & Valley	*10:10 A M	*3:15 P M
Akron, Canton & Chicago	*8:10 A M	*6:30 P M
Akron, Canton & Wooster, Defiance, Garrett, Marietta, Wheeling, Washington, D. C., and Baltimore	†2:55 P M	†11:00 A M

†Daily except Sunday. *Daily. Pullman's Palace Vestibule sleeping cars between Cleveland and Chicago.

THE IRON TRADE REVIEW

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THE CONDIT-FULLER CO.,

Pig and Bar Iron,

CLEVELAND, . OHIO.

E. C. POPE,

COMMISSION DEALER IN

Iron Ore, Pig Iron AND METALS.

Cleveland - Ohio.

ESTABLISHED 1854.

PETER GERLACH & CO.,

MAKERS OF

Saws, Tools and Machinery.

Office and Warerooms, 28 Columbus St.
Factories on Columbus, Winter and Leonard Sts.,

Cleveland, Ohio, U. S. A.

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LAKE SUPERIOR IRON ORES.

— AGENTS —

The Spanish-American Iron Co.,
Santiago, Cuba.

CLEVELAND. PHILADELPHIA.

$2.50 CLEVELAND TO BUFFALO

Via "C. & B. LINE,"

Commencing with opening of navigation (about April 1st). Magnificent side-wheel steel steamers

"State of Ohio" and "State of New York."

DAILY TIME TABLE.

SUNDAY INCLUDED.

Lv. Cleveland, 6:00 P.M. | Lv. Buffalo, 6:30 P.M.
Ar. Buffalo, 7:30 A.M. | Ar. Cleveland, 7:30 A.M.

CENTRAL STANDARD TIME.

Take the "C. & B. Line" steamers and enjoy a refreshing night's rest when enroute to **Buffalo, Niagara Falls, Toronto, New York Boston Albany, 1,000 Islands,** or any Eastern or Canadian point.

Cheap Excursions Weekly to Niagara Falls.

Send 4 cents postage for tourist pamphlet.

W. F. HERMAN, Gen'l Pass. Agt. **T. F. NEWMAN,** Gen'l Manager.
Cleveland, O.

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If you are seeking a new location it will pay you well to investigate the merits of our proposition.

Chicago Heights Land Association
M. H. KILGALLEN, Gen'l Mgr. CHICAGO

Emery.

	No. 4 to No. 54 46 gr.	150 gr.	Flour, C. F F. FF.
Kegs, ℔	4½c	5 c	2½c
½ kegs ℔	4¾c	5¼c	2¾c
¼ kegs ℔	5 c	5½c	3 c
10 ℔ cans, 10 in case	6 c	6½c	5 c
10 ℔ cans less than 10	10 c	10 c	7½c

Emery Cloth and Paper.

Barder, Adamson & Co. ..... dis 50@50&5
H. H. Barton ..... dis 50@50&5

Emery Wheels.

Detroit ..... dis 60@70
Norton's ..... dis 60@70
Grant ..... dis 60@70
Sterling ..... dis 60@70
Celluloid ..... dis 10&33⅓
Northampton ..... dis 55
Crystal ..... dis 65@70
Vitrified ..... dis 60@70
Vulcanite ..... dis 60&10
Hamden ..... dis 60&10@70
Cyclone ..... dis 60@60&10

Files.

Arcade ..... dis 60&10@60&10&10
Nicholson ..... dis 60&10@60&10&10
" X. F ..... dis 25
Kearney & Foot ..... dis 60&10@60&10&10
Black Diamond ..... dis 60&10@60&10&10
McClellan ..... dis 60&10@60&10&10
Disston's ..... dis 65@70
Western ..... dis 70
Stub's ..... dis 25
Grobet's ..... dis 30
Reynolds Bros.' Hand Cut ..... dis 50
Industry File Works Hand Cut ..... dis 50

Hammers.

P. S. W ..... dis 40
Atha new list, Jan. 15, 1887 ..... dis 50
Heavy hammers and sledges under 5 lbs 12c
" " " " over 5 lbs 10c

Jack Screws.

Illinois Bolt Co. list ..... dis 75

Nuts and Washers.

Size of bolt inches	¼	5-16	⅜	½	⅝	¾	1
Square	8	7	5½	4¼	4	3¾	3¼
Hexagon	15½	11½	8½	6	5¾	5¾	
Washers	9	8	7	5	4½	4½	4¼

In lots less than 100 lbs, ℔ lb add ¼c., 1 lb boxes add 1c to list.

Nails (wire).

List July 14, 1887 ..... dis 85
Standard Penny Nails, ℔ keg card rate
{ Car lots $2 30
{ Less than car lots $2.50

Oilers.

Zinc and Tin ..... dis 60
Brass and Copper ..... dis 50
Malleable (Hammer's), No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ℔ doz ..... dis 10@10&10

Picks.

Railroads, 5 to 6 lbs ..... $12 dis 60
" 6 to 7 lbs ..... $13 dis 60

Pulleys.

Iron Pulleys, Walker List ..... dis 50
Medart Pulleys ..... dis 50
Split Wood Pulleys ..... dis 55@60

Pulley Blocks.

Moore's Anti-Friction Differential Chain Pulley Block ..... dis 20

Rivets.

Iron, Thousand, list November 1, 1894 ..... dis 60@65
Iron, Ordinary, Cooper's Block and Carriage list November 1, 1894 ..... dis 60@65
Copper ..... dis 50@50&10

Taps.

Cards, Hand and Nut to 2 in ..... dis 50
Carpenters' " " " ..... dis 50
Morse " " " ..... dis 50
Pratt & Whitney " " new list ..... dis 10
Machine Screw Taps ..... dis 55
Pipe Taps to 2½ in ..... dis 70
Stay Bolt Taps ..... dis 25
Stove Bolt Taps ..... dis 55
Pulley Taps ..... dis 40

Vises.

Solid Box ..... dis 60
Parker's ..... dis 20@25
Prentiss ..... dis 20
Stephen's ..... dis 25@30
Barrett's ..... dis 30
Miller's Falls ..... dis 40
Merrill's ..... dis 15@20
Howard ..... dis 35

Wire.

New List, Apr. 9, 1894

Brass ..... dis 4c
Copper ..... dis 4c
Bright and annealed, Nos. 0@18 ..... dis 70&10@75
" " Nos. 19@26 ..... dis 75@75& 5
" " Nos. 27@36 ..... dis 75&10& 5
Coppered Nos. 0 to 18, market list ..... dis 70@70& 5
Galvanized Nos. 0 to 18 " " ..... dis65& 5
Tinned market Nos. 0 to 18 ..... dis 67½
Cast steel ..... dis 50
Tinned Broom Wire ..... dis 70&5@70&10
Annealed Fence, Nos. 8 and 9 ..... dis 75
Annealed Grape, Nos. 10 to 14 ..... dis 75
Stub's Steel Wire regular ..... 95c ℔ lb dis 30

Wrenches.

Coe's genuine ..... dis 50
Girard Standard ..... dis 70&10
Agricultural ..... dis 75&10
Mechanic's ..... dis 55&10& 5
Bemis & Call's Combination ..... dis 35
Donohue's Engineers ..... dis 20&10
Lamson & Sessions Engineers ..... dis 60
Billings & Spencer's Drop Forged ..... dis 25
William's " " ..... dis 25
Alligator " " ..... dis 40

Perforated Filter Press Plates.

THE HARRINGTON & KING PERFORATING CO. CHICAGO.

BRONZE SCREEN PLATES To withstand action of ACIDULATED WATERS.

PERFORATORS OF STEEL, IRON, COPPER, ZINC, BRASS AND TIN.

For use in GRAIN CLEANING AND MINING MACHINERY, WOOLEN, COTTON, PAPER AND PULP MILLS, RICE, FLOUR AND COTTON SEED OIL MILLS, SUGAR AND MALT HOUSES. DISTILLERIES, FILTER PRESSES. STONE, COAL, AND ORE SCREENS, BRICK AND TILE WORKS, FILTERS, SPARK ARRESTERS, GAS AND WATER WORKS, OIL, GAS AND VAPOR STOVES, COFFEE MACHINERY, ETC.

STANDARD SIZES PERFORATED TIN AND BRASS ALWAYS IN STOCK.

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THE ATLANTA EXPOSITION

WILL BE HELD

Sept. 18th to Dec. 31st, 1895.

On ground traversed by rifle pits, over which Sherman threw the first shell into Atlanta 31 years ago, the Exposition is fast taking shape. The excellent railway facilities of the great

QUEEN AND CRESCENT ROUTE

And Southern Ry.

To Atlanta, together with low railway rates, will enable the people to make a delightful trip at but small expense.

The Queen & Crescent runs superb vestibuled trains with through sleepers and carrying Parlor, Cafe and Observation Cars, from Cincinnati direct to Atlanta. More than 100 miles shortest line. Special low reduced rates to the Exposition. Do you want to know something about it in detail?

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W. C. RINEARSON, G. P. A., Cincinnati.

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If you are seeking a new location it will pay you well to investigate the merits of our proposition.

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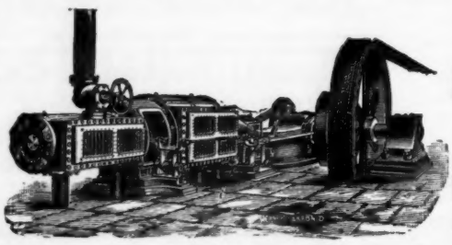
M. H. KILGALLEN, Gen'l Mgr. CHICAGO

WILLIAM TOD & CO.

YOUNGSTOWN, OHIO.

THE PORTER-HAMILTON ENGINE

SINGLE, COMPOUND & CONDENSING



Blowing Engines.

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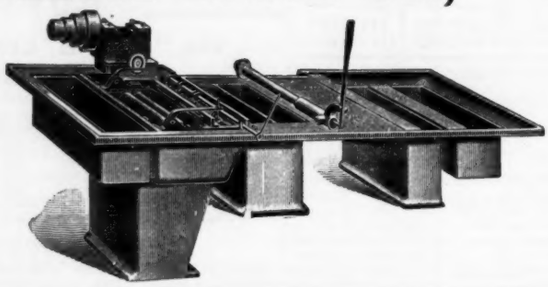

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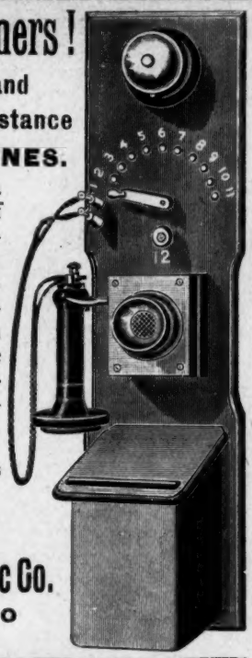

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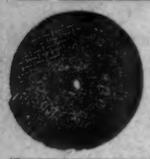

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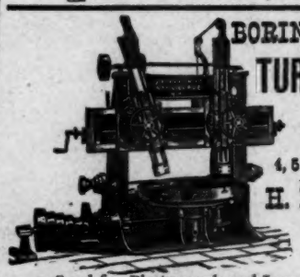

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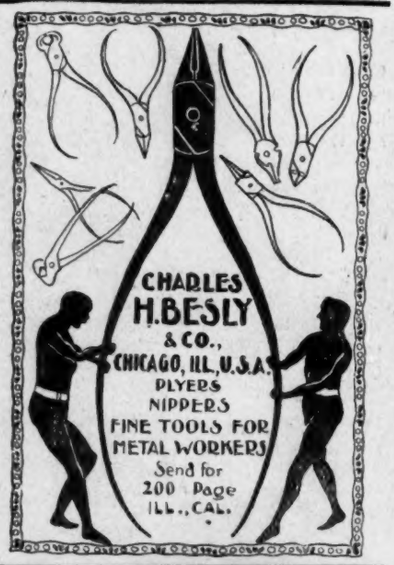

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